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Among the Manufacturers.

THE WELL-DESERVED SUCCESS OF MESSRS. HOLMES, BOOTH & HAYDENS.

As is well-known, it is only within a few years that electrical science has made gigantic strides. Now, it may safely be said, we are arrived at the electrical era. Very many important inventions have recently been made in the electrical field, and the prospects for the immediate future are even more gratifying.

When the great demand came for electrical goods, insulated copper and iron wire especially, many manufacturing houses strove to meet it, and vied with each other as to who should do the largest business. It is curious as a study of commercial practice to note the various business systems employed by these several manufacturing houses, the progress each has made from time to time, and the present condition of each.

Some of these houses adopted the perilous principle of making large sales under all conditions, and of underbidding their neighbors at all hazards.

Now, there are two ways of underbidding your neighbor. One is to make an inferior article and sell it for the genuine; and another is to sell goods for less than they cost to manufacture. Both systems lead to disaster. The first is a common swindle, and must, of a necessity, be soon found out by the victims, and it does not require a very acute intellect to discover that the house addicted to the last-named practice can maintain its financial integrity only so long as its capital suffices to meet its continuous losses. Like the mushroom, the business carried on on such principles grows rapidly, and has all the appearance of perfect health; but like the mushroom, again, its decay and fall is as rapid as was its rise and development.

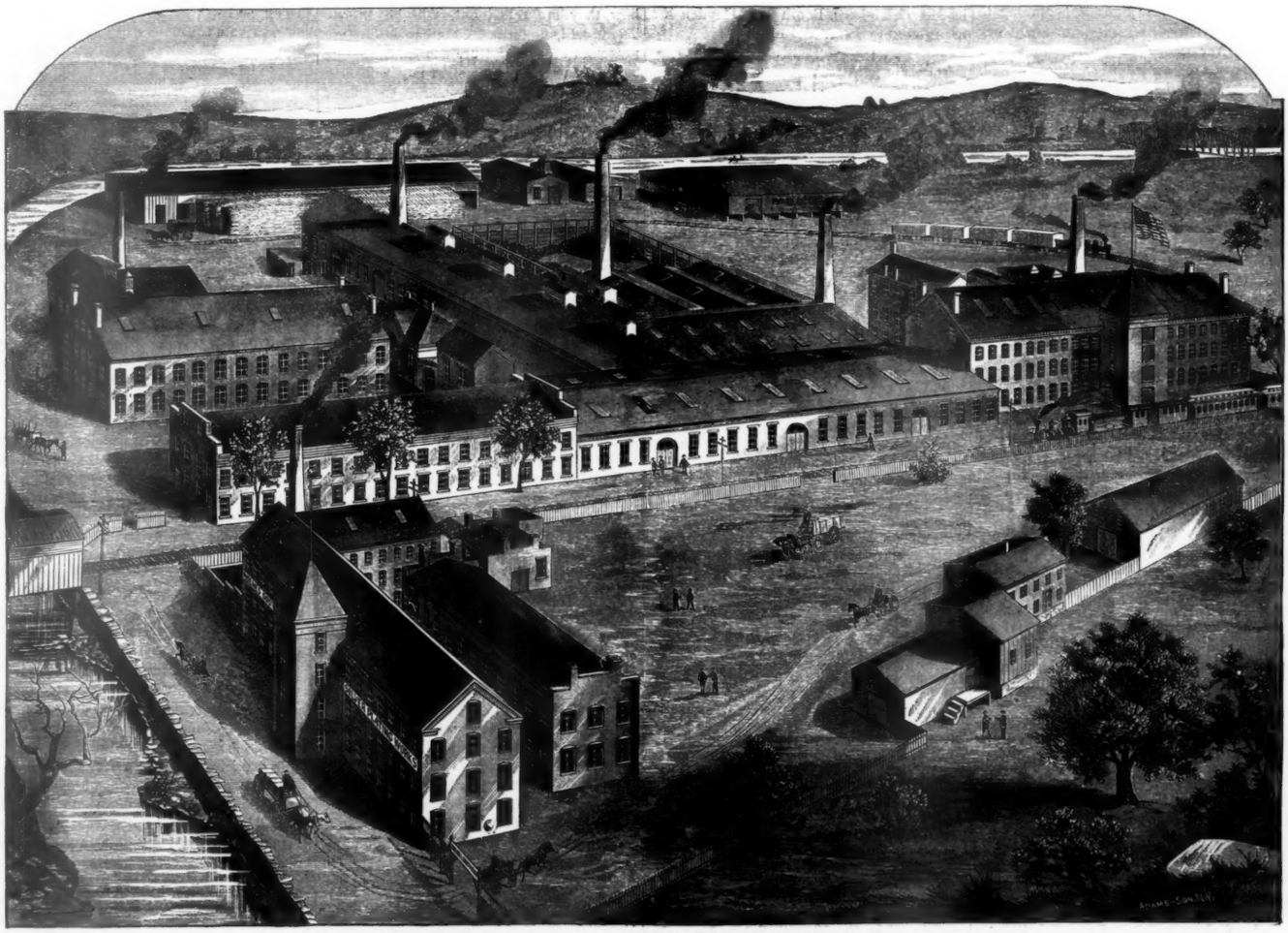
So it has been in the electric supply business. There were houses which started on insecure foundations, and carried on business based upon false and erroneous ideas. These houses for a time did an immense business, but as soon as the unreliability of their goods was discovered, and the falsity of their guarantees became apparent, they began to decline, until to-day they have a reputation that does not recommend them to buyers, and the only wonder is that they are able to make their expenses.

On the other hand, there is a class of manufacturing houses that carry on their affairs on strict business principles; that never make assertions regarding goods that cannot readily be verified, and that never raise hopes in the mind of the buyer that cannot be realized.

Such a house is Messrs. Holmes, Booth & Hayden, manufacturers of fire-proof electric light wire, made from pure Lake Superior copper, and insulated copper and iron wire for telephone and telegraph use. The house of Holmes, Booth & Hayden is a credit to the trade, and it is, therefore, with not a little pleasure that the REVIEW, which may always be looked for on the side of honesty and fair dealing, presents to its readers a description of its workings.

Those who send orders for goods to this house from distant parts may rest assured that they will be attended to with the same care and dispatch as though they were here themselves to overlook the business. Nor will it cost them more money to obtain their goods in this way. The house of Holmes, Booth & Hayden has but one price. There is no dickering and cheapening of goods; a system that originated—so far as this country is concerned—in Chatham Street, and prevails to a more or less extent in every branch of trade.

The plan adopted long since, and never departed from, by the house of Holmes, Booth & Hayden of telling the whole truth about goods, and never misrepresenting them, has proved successful in the extreme, and to-day this house is one of the most im-



FACTORIES OF HOLMES, BOOTH AND HAYDEN, WATERBURY, CONN.

portant engaged in manufacture. This company was established in 1853, and so large has its business become that offices and warerooms have been established in New York, Boston, and Philadelphia.

Their extension factories are located at Waterbury, and so great is the demand upon them for their products that it requires a force of nearly 1,000 employes in the different departments. The general manager of the concern is Samuel H. Willard, assisted in New York by Henry C. Adams. Both of these gentlemen have grown up with the business, and are deservedly popular with the trade.

The main business of this company is sheet and roll brass, copper and German silver, brass and copper wire, rods, tubing, etc. Other goods manufactured from the product of their rolling and wire mills, are copper rivets and burrs, brass chains, kerosene lamp burners and trimmings in great variety, lanterns, library lamps, patent paper fasteners; finest quality electro-silver plated spoons, forks, etc.

In the past few years the manufacture of wire has grown considerably in importance. The magnetic telegraph has been extended to all parts of the country, new companies have been started, and the rivalry has been such that almost every place of any importance in the land has its connections, until the wires are thousands of miles in length. In addition to this, the telephone has recently come into prominence in the larger cities, and the electric light is beginning to be extensively used, resulting in a net-work of wire over the great thoroughfares that reminds one of an immense spider's web. Among the productions of this company will be found pure copper wire drawn from best Lake Superior copper, which is especially excellent for electrical purposes. This wire when drawn hard, makes a very superior line wire for telephones and telegraphs.

Patent "K K" copper and iron wire is being extensively used for telephones and telegraphs.

Their Patented Fireproof Electric Light Line Wire, finished under a patented process, is considered the handsomest and best in the market. Patented "Acme" Electric Light Wire, fire-proof, water-proof. Magnet wire for dynamos is finely and evenly wrapped.

This company also make an improved micrometer gauge, the object of which is to provide a gauge in which the measuring bar may be forced against the object to be measured, always with a certain uniform pressure, thereby rendering the instrument more accurate than heretofore. Another advantage of the improvement is that there will be no danger of causing the ends of the measuring bars to be imbedded in, so as to indent the object measured.

The company also makes Clumer's Ajax metals. Ajax spinners' bronze can be spun into the most difficult shapes without annealing; does not fire crack; is of a gold, bronze color, and, after polishing, maintains a metallic luster almost equal to gold in appearance.

The company makes patent copper rivets and burrs. The old style conical rivet heads do not grasp the surface of the leather and will easily pull out, while this improvement is for giving to the conical-headed rivet a greater hold on the leather or fabric without interfering with the other recognized qualities of the rivet. These rivets are specially adapted for leather and rubber belts and harness making.

The Acme line wire is both water and fire proof. It is first covered with a fire proof insulation, a second coating of water-proof material, and a third coating of fire-proof material same as next the wire, thus placing the water-proof material away from the action of the atmosphere.

The wire is so thoroughly insulated that there is little danger from the electric current in handling while attached to the dynamo.

The company makes the flexible insulated copper electric light wire, and the insulated B, B, galvanized iron wire for telegraph and telephone use, double braided with red and white cotton. This wire is first run through a material that effectually prevents the insulation from slipping on the wire, and adds very much to its durability.

The patent "K. K." insulated wire has made a name for itself. It is particularly adapted for telephone and telegraph use. Prof. Morton says of it: "I have tested it with ozone, which concentrates the atmospheric influences of years into an hour, and find it stands this thoroughly." Here are a few of many letters of recommendation of this insulated wire:

OFFICE SOUTHERN BELL T. & T. Co., NEW YORK. Feb. 2, 1883.

GENTLEMEN: Our district superintendent reports that the "K. K." wire we have bought of you give very good satisfaction in every respect. Yours truly,

D. I. CARSON,
Secretary and General Superintendent.

EXECUTIVE OFFICES,
The National Bell of Maine, Boston and Northern Suburban Bay State, Northern Massachusetts Union Telegraph and Telephone Companies,
LOWELL, MASS., Jan. 16, 1883.

GENTLEMEN: Allow me to inform you that your "K. K." insulation for copper and iron wires meet with the approval of all who use it. Yours truly,

W. A. BELCHER,
Superintendent Supply Department.

This wire has been adopted by the New York Fire Department, and others.

The conductivity of the copper wire sold by Messrs. Holmes, Booth and Hayden has been found by Prof. Morton to be:

Length tested	100 feet.
Diameter of wire	.08 inch.
Weight per mile	112 lbs.
Resistance in ohms per mile at 75° F.	8.81
Conductivity	99.8

In order to show the advantages of the copper wire made by this company, here is a comparative list of the wires of the various metals:

SPECIMENS TESTED.	PULLING STRESS PER SQUARE INCH.	
	HARD. LBS.	ANNEALED. LBS.
Copper	63.122	37.002
Brass	81.156	51.550
Charcoal iron	65.834	46.060
Coke iron	65.321	61.294
Steel	120.976	74.637
Phos. Bronze, No. 1	159 515	58.853
" " No. 2	151.119	64.569
" " No. 3	139.141	54.111
" " No. 4	120.900	53.371

SPECIMENS TESTED.	EXTENSION PER CENT.		NO. TWISTS IN 5 INCHES
	ANNEALED.	HARD.	ANNEALED.
Copper	34.1	86.8	96
Brass	36 5	14 7	57
Charcoal iron	28.	48.	87
Coke iron	17.	26.	44
Steel	10.9	*	79
Phos. Bronze, No. 1	46.6	13.3	66
" " No. 2	42.8	15.8	60
" " No. 3	44.9	17.3	53
" " No. 4	42.4	13.	124

Of the eight pieces of steel tested, three stood from 40 to 45 twists, and five stood from 1½ to 4 twists.

The house of Holmes, Booth & Hayden deserves the success it has achieved. It has arrived at its present position not through any fictitious means, from which, when the truth is known, it will have to descend, but by a conscientious adherence to strict business principles and fair dealing. The REVIEW wishes them every success.

The Electrical Exhibition.

THE PROGRESS OF THE FRANKLIN INSTITUTE'S GREAT WORK.

The contract for erecting the building in which the International Electrical Exhibition is to be held in September next, under the auspices of the Franklin Institute, has been awarded to J. R. Garber. It will be located at Thirty-second and Lancaster avenue, and will cover 67,000 square feet of space. The building will be of wood and glass, and will be modeled somewhat after that of the Agricultural Building at the Centennial, and will cost about $35,000. The exhibition will be opened on September 2, and will continue for six weeks, remaining open until 10 P. M. every night, except on Sundays, when it will be closed entirely. The proceeds of the exhibition will be used toward erecting a permanent fire-proof building for the use of the Franklin Institute. Already seventy-five exhibitors have presented applications for space. Foreign governments are taking an interest in the affair, Secretary of State Frelinghuysen having notified them of the exhibition. Many novel things will be seen there, and the public will have a chance of learning much about electricity and its uses. An electrical railway will be shown, with large cars being propelled by an invisible source. An electrical launch will be among the attractions, as will also an engine capable of supplying 1,500 horse-power to monster dynamo machines, which will in turn transmit the power all over the building. Inventors Edison and Graham Bell, of telephone fame, will make exhibits. The intention is to make the exhibition popular as well as scientific, and to attract to it, so far as it can be done, the attention of the public as well as of scientists. The process of manufacturing carbons, and how they are rolled out, will be shown. There will, doubtless, be other interesting processes of manufacture shown, so that no lack of interest need rest in any who may attend the exhibition.

Electricity and Economy.

WILL IT PAY THE CITY TO GO BACK TO GAS LAMPS AGAIN?

To the Editor of the Herald:—I have read with great care and interest the article published in last Friday's *Herald* concerning the proposed plan for lighting the city, involving the discontinuance of a large number of electric lights, and the substitution of gas instead. I find that great stress is laid upon the value of the large gas lamps that it is proposed to use, and the claim is put forth that they are superior in economy to the electric light. Let us see. At the reduced price at which the gas company now furnishes gas to the city, the reduction being the direct result of the introduction of the electric light, gas costs the city $1.30 per 1,000 feet. An electric light, burning all night, costs exactly 65 cents. These figures are the basis of the figuring. One of the large gas lamps, such as may be seen in Charlestown Square, consumes 100 feet of gas per hour. The average lighting time, according to the actual record, is 10½ hours. Thus the large lamp would burn 1,050 feet of gas per night, on the average. At $1 30 per 1,000, this would cost the city $1.36 per night. It gives light to the extent of about 300 candles. An electric light, giving light to the extent of 1,600 candles, costs 65 cents per night. Which is the cheaper?

It is true that the report of the superintendent of lamps gives a very different figure for the cost of this lamp to the city. It is because, in order to get the city to take it, the gas company has only charged for it at the rate of 26 feet per hour, up to the present time. But, under the plan proposed, gas consumed is to be charged at the rate of $1.30, and the large burner in Charlestown Square will cost the city $496 per annum, against $237, the annual cost of an electric light. Does this look like economy? It is true that the large light in Charlestown Square did displace six or seven ordinary gas burners. In such a space it might have displaced ten, had they been there, and certainly an electric light, with five times the illuminating power, would have done as much, and more. But in our streets neither an electric light nor a big gas lamp can actually cause the removal of so many on an average, because there are alleyways and side streets which must be illuminated, and, in order to accomplish this, it is often necessary to keep a street gas lamp at the corner of each street or alley, even though there be an electric light for the illumination of the principal street in full operation within ten feet of it.

It is very certain that not only the comfor and convenience of our citizens, but their safety and the security of their property as well, demand that our streets be thoroughly lighted. The police department has borne testimony to the value of brilliant illumination in preventing crime, and it is a matter of common knowledge that streets which were once infested by people of very questionable character and purpose have been deserted by them since they were lighted by the electric light.

Light costs money, of course. But it is a matter of common knowledge, provable beyond the possibility of doubt, that no illuminant known begins to give the light for the money that the electric light affords.

At the time the electric light was introduced, Boston was paying $2 per 1,000 feet for gas, and private consumers were paying $2.80. Now the city pays $1.30 and private consumers $1.80. This is what the electric light has done for the people, individually and as a whole. Would it be wise to dispense with the illuminant which gives 10 times as much light for the money as gas, and at the same time tends to keep the price of gas within reasonable limits? This much is certain: Exclude the electric light from Boston, and within six months the price of gas to private consumers will go back to the old figures, which were carefully adjusted so as to be as large as possible without driving consumers to the use of kerosene.

Boston, Mass. EDWARD H. GOFF.

Telpherage.

"Telepherage, or the transmission of vehicles by electricity to a distance, independently of any control exercised from the vehicle," is the invention of Prof. Fleeming Jenkin, of England, who considered that in simply adapting electric motors to the old form of railway and rolling stock, inventors had not gone far enough.

Prof. Jenkin proposes to produce power more economically, and control it more effectually and more cheaply, in large stationary engines than in locomotives; drawing off power from any desired number of points of a conductor many miles long; cutting the power off from any desired motor by simply breaking contact between two pieces of metal, and restoring the power instantly, when wished. This system permits better distribution of load, by having many small light trains.

It is not necessary to have a separate driver for each train—as a "light, continuous stream of trains" can be worked automatically, using a self-acting block to prevent collisions.

Suspended overhead rods or ropes are superior to rigid elevated girders, requiring few supports, giving good insulation, requiring no bridges nor earth-works, and being safe from damage to and by men and cattle; while requiring no purchase of ground.

Profs. Ayston and Perry had devised an automatic system for rendering the control of vehicles on electric railways independent of guard or driver, and this invention has been taken advantage of in "telpherage."

The line at Weston has posts, sixty feet apart, with two lines of rods or ropes, supported thereon by cross-heads. Each line carries a train. The round steel rod is preferred to square steel rods, and steel wire ropes. Each section, of 120 feet, is insulated from its neighbors. Cast iron supporting saddles, at the posts, are curved vertically, to allow the wheels to pass easily. Each alternate section is insulated from the ground; all the insulated sections are connected, as are all the uninsulated. The train is as long as a section, and consists of seven buckets and a "locomotive," evenly spaced with ash distance pieces—each bucket carrying two and one-half hundred weight, and weighing about one-half hundred weight, net. The "locomotive" weighs three hundred weight.

The buckets and locomotive hang below the line from wheels, the hangers clearing the supports. The motor, or dynamo, on the locomotive is supported on two broad, flat wheels, and is driven by two horizontal grip-wheels, connected with the motor by "nest gearing," and giving one and one half H. P. as a maximum. A wire connects one pole of the motor with the leading wheel of the train, a second wire with the trailing wheel; the other wheels being insulated.

Thus, whenever the train stands at bridges a gap separates an insulated and an uninsulated section.

The insulated sections receive a current from a stationary dynamo; the current passing from the insulated section through the motor, drives it.

The trial road conveys a useful load of fifteen hundred weight, on every 130 feet, = 16½ tons per mile, or, at five miles per hour, ninety-two and one-half tons of goods per hour, or in a day of twenty hours, 1,850 tons each way—and all with inch ropes.

Great Electric Lighting Scheme.

CHICAGO, ILL., March 13.—It is proposed by several gentlemen, having various large electrical interests in the West, to organize a company with a capital of half a million of dollars, to carry on the business of constructing and putting in electric lighting plants of the Thomson-Houston system, in the Northwestern States, precisely as is being done in the Eastern States by the American Electric and Illuminating Company, of Boston. Such a company would undoubtedly have an ample field and prove very successful.

Worcester's Contract with the Worcester Electric Light Company.

The committee on street lights held a meeting last week, and took final action with regard to Worcester's electric lights. The determination was the signing of a contract by the Mayor with the Worcester Electric Light Company, in which the latter agree to furnish the city with electric lights for one year, dating from the first day of this month, at 65 cents for each light. The time set for furnishing the light is from dark until daylight, and the hours will vary with the season. The contract calls for 50 lights, 45 of which are now in order, and the other five will soon be ready. The location for each of the five new lights is, respectively, at the corner of Main and Front Streets, the corner of Main and Mechanic Streets, corner of Shrewsbury and Mulberry Streets, corner of Summer and Fulton Streets, and Bloomingdale and Grafton Street. The cost to the city, by these terms of the contract, for maintaining the 50 lights for one year, covering 365 nights, will be $11,862.50. They will displace about 140 of the regular gas-lights, leaving a balance of about 675.

It has been decided to have an electric light to replace the large gas lamp near the center of the common, and it will be put there probably this month. A high pole with a circle near the top, to contain three or four electric lights, is an idea suggested by Superintendent Coughlan, of the Electric Light Company, and he claims that such an arrangement would light a large part of the common now entirely unprovided for.

In addition to the 50 lights contracted for by the city, the Worcester Electric Light Company have 120 private lights in operation, provided from their American dynamos. They have put in 21 new lights during the last 30 days, and are now running to nearly their full capacity.

Electric Lights in Canada.

THE AMERICAN ELECTRIC AND ILLUMINATING COMPANY DISPOSES OF ITS BUSINESS IN THE DOMINION TO A NEW COMPANY.

MONTREAL, P. Q.—It is just learned that negotiations, which have been in progress for some days past, have culminated in an agreement on the part of the American Electric and Illuminating Company to sell its business, plant, manufactory, and right to use the Thomson-Houston system of electric lighting for the entire Dominion of Canada, to the Royal Electric Company, to be chartered by the provincial parliament of Quebec, and capitalized at $250,000. For this sum the new corporation, which includes gentlemen prominent in electrical matters and in financial affairs, secures the sole ownership of the only established and successful system of electric lighting in the Dominion, and enters, no doubt, on a prosperous and honorable career.

The franchise and property were acquired by the American Company at a very low price some three months ago, when the field was undeveloped and the business had been badly run down by the company previously controlling it. During these three months the American Company has infused its customary energy into the work, has built up the business to a very prosperous standard, and is now enabled to sell it at a very handsome profit. This will also enable the American Company to devote all its energies to the extension of its business in the United States, and will give it additional capital for the purpose. At the same time the Canadian Company gets a splendid business for a reasonable sum. The two companies will maintain close relations, and will jointly enjoy the benefits of any future inventions secured by either.

An Important Invention by two Detroit Gentlemen.

The Detroit *Free Press* says that it is a fact well known to experts and others who use the electric incandescent light that the generator requires to run at very high and nearly uniform velocity. The "approximate" of revolution has heretofore been accomplished by the use of very high speed reciprocating engines to overcome the check that the crank of the engine receives at each end of the piston stroke, and which check produces the flicker to the incandescent electric lights.

To overcome this trouble a class of engines made by only three or four manufacturers in the United States has come into use. These engines are especially intended for transmitting uniform motion to the generators of dynamo machines, and they are very expensive, both in first cost and subsequent maintenance, as they require an expert and superior mechanic to keep them in good running order. To this may be added the fact that very large engines cannot be run at high speed, so that an engine of sufficient capacity to light a big section of the city cannot be used for this purpose. All the efforts heretofore made in that line have been by the employment of a number of small engines to furnish the requisite power, as not more than two dynamos can be driven, as at present used, by one engine. It will thus be seen that great expense and complication stand in the way of using the electric light in a central system. To obviate these difficulties a device has been invented by J. R. Markie and J. B. Wayne, of Detroit, and a test plant of fifty lights has been in operation during the winter, which utilizes a slow-running engine in connection with the patent device for giving the uniform motion that is absolutely necessary to the generator of a dynamo machine, and produces a light of great steadiness and brilliancy.

This device consists in using a counter shaft on which are a fly wheel and small friction wheel, driven by a larger friction wheel on the engine shaft. A very rapid motion is communicated to the countershaft, which, being in connection with the running engine shaft by means of the friction wheels above mentioned, is used to control the motion of the crank and thus prevent checking at each end of the piston travel. The result is a steady round motion, communicated to a slow moving engine, a desideratum never before achieved for this purpose. The following figures are applicable to the plant in use at the Fulton Iron and Engine Works, at the corner of Brush and Woodbridge streets:

Engine six-inch bore eight-inch stroke.
Number of revolutions of engine.....120
Number of revolutions of counter shaft..840
Number of lights..... 50

The engine is known as a common throttle engine without cut-off, and using a Judson governor.

In a conversation with Mr. Wayne yesterday that gentleman said it had now become possible to place the dynamos for supplying central plants on the same basis as the water supply of a city—that is to say, by a large compound, slow running and very economical steam engine, operating direct from the engine shaft and without belting. One man can attend to all the dynamos that a large engine will drive.

This invention may be seen by the curious in operation at the works on Brush street.

Power from Niagara Falls to Light 65 Cities with Electric Lights.

The correspondent of *The Sun* has received a letter from Leonard Henkle, inventor and electrician of Rochester, saying that, although the action of the New York Legislature in favor of the National Park compels him to abandon Prospect Park and the American side of Niagara for electric lighting purposes, he has nevertheless negotiated for the purchase of land on the Canada side of the river and for power from the Great Horseshoe Fall for carrying out his original plan. That plan contemplated the lighting of sixty-five American and Canadian cities, connected by means of underground cables with electric lights generated at Niagara. The plans are all drawn for ten hydraulic engines of 200,000 horse-power each, and gigantic machinery. That Henkle himself means business is attested by the fact that he will soon open an office on the Canada side of the river, and endeavor to complete arrangements with capitalists, whom he expects to furnish $22,000,000 for the undertaking.

A Theory of Light, Radiant Heat, Electricity and Magnetism.

The author of this pamphlet, Mr. I. E Craig, of Ohio, proposes a new theory to explain the phenomena of radiant forces in nature. Not content with the existing theory of propagation by wave motion through the ether, he seeeks to demonstrate that all the various radiant forces are functions of gravity; in other words, that Newton's great law of mutual attraction or gravitation applies equally as well to the molecules of bodies; and, while not denying, in a certain restricted sense, the wave-like character of these excitements, he seeks to demonstrate that they pass from molecule to molecule by reason of a disturbance of the equilibrium of their attractions. In conformity with his theory of the non-existence of the ether, he says that the interplanetary spaces are not voids, but filled with gaseous matter at the measure of attenuation corresponding to the temperature and pressure at which it exists, and this furnishes the material basis for the transmission of light and heat across cosmical spaces.

A Home-Manufactured Burglar-Alarm, and How it Worked.

A burglar was to Mrs. Plunkett a holy terror, and she was always possessed with the idea that every burglar who ever visited this city got his eye on her house the first thing.

It is not strange then that when Plunkett came home day before yesterday and told the old lady that he had gotten up a burglar-alarm that could never fail, she was delighted, and actually drew the first long breath that had entered her withered lungs since she heard of the burglaries of the previous day.

"It's dead sure, is it, Plunkett?" said she.

"Sure? I jist wisht I was as sure of gittin' to heaven. I'll show ye."

And then he showed his plan. He had three large oyster cans, partly filled with pebbles. His scheme was to leave his bedroom door, that of his son Erastus, and the one in the dining-room, slightly ajar. On the top of the door he would place the can, leaning it slightly against the door casing.

Of course, at the least push the can would fall and the pebbles rattle over the floor, and not only scare the burglar half to death, but at the same time wake every body on the block.

It was quite a good idea, and would have worked nicely; but the old man forgot to tell Erastus, and he also forgot something else, which will appear later.

That night Erastus came home half full of beer and went to bed early. Soon the old man came, and before retiring proceeded to fix the doors. He found the one in the room of Erastus wide open and that youth sound asleep.

"I'll just fix this and not wake him," said he. "He'll see this in the mornin' and take it down hisself." So, cautiously fixing it, he went out.

He then fixed the others and retired, feeling that he had done his duty. He rather hankered for a burglar, as he wanted to hear him break through a whole window in his frantic efforts to escape from that terrible burglar-alarm.

And now came the trouble.

The old family cat had a way of going up to the room of Erastus every night. Erastus would come home with remnants of cheese sandwiches in his pockets, and they acted as a bait for all the mice in the house. The old cat knew this, and as the door was always open she used to treat herself to a mouse lunch whenever she was hungry.

Last night about twelve she went up as usual. If she was surprised at finding the door nearly closed, she didn't say any thing, but gently introducing her head, she walked in—or rather she started in—

* * * * * ! ! ! !
* * * * * * ! ! ! ! !
* * * * * * * ! ! ! ! ! ! !

A space of about two seconds is supposed to intervene between each of the above lines.

The first represents her entrance to Erastus' room; the second is when she thought the cat Hades was coming, and made one bolt across the hall, and struck the old man's door—and another oyster can—and the third is where she gave one despairing yowl and threw herself wildly over the banisters and shot into the dining-room just in time for the third can to hit right in the highest arch of her back.

* * * * * * * * *

Upstairs all was confusion. Awakening out of a sound sleep, Erastus grabbed an umbrella and bolted into the hall just in time to meet his father, who in his wild haste had forgot his pistol and grabbed a trusty boot.

Each took the other for a burglar, and went to work, and such a hammering and slipping and swearing and tearing off of toe-nails was never heard before in the Second Ward.

How long they would have fought no one knows, but just as he was delivering an extra blow with the boot the old man shouted:

"Gol dern ye!"

And Erastus, recognizing his father's favorite expression, let go of his throat and cried:

"Is that you, pap?"

That settled the whole business. Mutual explanations followed, and the old lady was pulled out from under the bed to go and hunt up a lot of arnica and bandages and court-plaster, etc.

Neither old Plunkett nor Erastus appeared on the street yesterday morning.

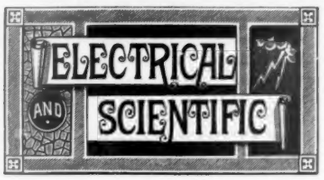
A man with a map of the Russian war done in court-plaster on his face doesn't feel like coming down town. They are both praying that their faces will heal up before the meeting of the Grand Lodge of the A. O. U. W., as they both want to go to the banquet.

Eight policemen slunk around in the alley and behind the tree-boxes near Plunkett's house till daylight this morning, lying for the cause of all the racket, but they didn't catch any burglars.

At seven a cat with an abnormal tail climbed slowly and cautiously up the back fence and gave a long and steadfast look at the mansion of the Plunketts, and it appeared just at that moment that the hired girl threw the three oyster-cans out into the back yard.

The cat gave a last indignant yell and a spit, and the way she fled like a hairy meteor up the alley toward the sand-pit is said to have knocked Jay-Eye-See into a cocked hat.

Plunkett will not patent his invention.



The sum of $25,000 has been appropriated by Congress for electric lighting at the capital.

The New York and Brooklyn Electric Light Company have the contract for lighting the new Mutual Life building in New York on the incandescent system. Their plant will consist of eight dynamos.

The Merchants' Electric Light and Power Company's new station in Boston will be opened next Monday. This is one of the finest central stations in this country, and reflects great credit on the management of that company.

Direct electric lighting of one of the trains of the District Railway between Kensington and Putney is stated to be very successful. The light is not only superior to that obtained from oil or gas, but is reported to cost only two-thirds that of the latter.

ILION, N. Y.—The Ilion *Citizen* for the week last past has been printing its entire edition of 3,000 copies by electricity, using an electric motor, deriving the current from a ten-light dynamo fifteen rods away. It is the first newspaper in the country thus printed.

The government electric light at Hallett's Point, Hell Gate, is almost completed. The immense framework, 250 feet high, is finished, and the national ensign was displayed from the staff this week. The machinery for lighting has not yet been put in place, but it is expected that it will be ready within the next few weeks.

In conversation with President William H. Wahl, of the Franklin Institute, concerning the coming exhibit of electric machinery and steam launches in the institute last week, he said: "The applications thus far received for permission to make exhibits number seventy-six. This number includes a great variety of electrical launches, devices, machinery, instruments, &c., which it is impossible for me to enumerate at present. The exhibition promises to be a great success."

The Italian Exhibition, which opens at Turin in April, will make a specialty of electrical apparatus and processes, and offers a prize of $5,000, open for competition to all countries, for the best apparatus for the transmission of water power by means of electricity. The show in general is intended to be an exposition of the agricultural, industrial and scientific progress of Italy, and an art department will be an important feature. In contribution to the electrical department the Government remits all duties on foreign exhibits, and the committee in control furnishes space and motive power gratuitously to exhibitors in this specialty.

M. A. Ricco, of Palermo, has invented a very original electro-magnet. He rolls a long strip of sheet iron round a nut of soft iron, placing oiled paper between the different layers of the strip to isolate them. A pole is connected with the nut, to which the inner end of the iron strip is soldered, while the other is connected with its outer end. The current passing through the strip magnetizes not only the nut, but also each layer of the strip of iron, which plays the double role of conductor and magnetic substance, so that the lines of power produced by the conductor are condensed. It is stated that the power of such a magnet is considerably greater than that of an ordinary electro-magnet.

A meeting of the Buffalo Electrical Society was held on the 10th inst., which was well attended. A very interesting and instructive paper on "Wheatstone's Bridge and Galvanometer System of Wire Measurements" was read by Thomas A. Laird, wire chief of the Western Union Telegraph Company. The paper dealt with the manner in which crosses and groundings in wires could be accurately located. Some very good illustrations were given by different members of the society, which were exemplified by diagrams.

An ingenious apparatus has been made for Mr. Borden, of Fall River, Mass., which he finds of service in his sleeping rooms. It consists of a small battery connected with an Edison incandescent lamp, which can be lighted up almost instantly. The circuit wires run from the battery and lamp, located on shelf or table in the room, to any convenient position near the bed. By a push-button, or any other simple method, the circuit may be closed and the room illuminated, the lamp giving about two candle-power. This arrangement of this household convenience was done by Mr. Frank W. Harrington, superintendent of the Western Electric Company's factory in Boston, who is now fitting up several for the use of prominent men in New England.

The McTighe Electric Light and Manufacturing Company, of 33, 34 and 35 Water Street, Pittsburgh, will move in April to more commodious quarters, corner of Wood Street and First Avenue. They will occupy the entire building, 40x80, four floors. Mr. H. J. Schneider, who has charge of the manufacturing department, is an experienced practical electrician. The president of the company is Mr. E. M. Ferguson, Mr. T. J. McTighe is the secretary, and Mr. J. T. McConnell superintendent. It is claimed for the McTighe system of arc lighting that with economy of power and simplicity of apparatus it furnishes a very steady, pure white light. The company say that their machines are also well adapted for incandescent lighting. They are now prepared to give estimates on plants required.

Messrs. Laing, Wharton, and Down, in conjunction with Mr. G. V. C. Holmes, have recently carried out several temporary installations of Swan lamps, and Holmes' primary battery, for dances, evening parties, &c. Amongst others was a ball last week at Kensington, at the house of Mr. Henn Collins, Q.C., and also a dance given by Mrs. Wharton, at Old Charlton. The lamps used in all cases have been the low resistance ten candle-power Swan lamps, which, when worked over power, afford a beautiful light, and in every case have given complete satisfaction, not only as regards the actual lighting, but also to the ladies, who at first very much feared the electric light for their complexions and dresses, but eventually were unanimous in thinking that it was most becoming, so says *Engineering*, of London.

The annual election of officers for the New York Electrical Society took place March 5th. The following are the officers chosen for the ensuing year:

President, Prof. P. H. Vanderlbeyde; 1st vice-president, Geo. B. Scott; 2d vice-president, C. S. H. Small; 3d vice-president, E. A. Leslie; 4th vice-president, E. L. Bradley; 5th vice-president, W. J. Johnson; 6th vice-president, Gerritt Smith; Recording Secretary, A. A. Knudson; Financial Secretary, Minor M Davis: Treasurer, F. W. Jones. Extra members of the Executive Committee, Thos. R. Taltavall, Gerritt Smith, C. O. Mailloux and George Worthington.

When the election was concluded Mr. F. W. Jones placed in the hands of the society $20 to be awarded to the author of the best paper read before the society within the next three months, the president and two members of the society to make the award. The society is to prescribe the length, subject, etc., of the paper, and competition is to be open only to members in good standing.

A hearty vote of thanks was tendered to Mr. Jones for his generous interest, and to the retiring officers, after which the meeting adjourned.

The Bridgeport Electric Light Company are busily engaged in putting up their poles on the principal streets for the operation of the Thompson & Houston electric system of lights, a number of which are already in use. They are moving their works from the old organ shop to the Coach Lace Company's building on John street. They have leased the whole lower half of this building for a term of five years, and are erecting additional buildings in the rear. They will have their new electrical machines in position and the whole in running order in about two weeks. They have already secured subscribers for over fifty lights, and as fast as the wires can be put up they will be supplied. Among them we notice Fostor, Besse & Co., Henry Setzer, F. S. Stevens & Co., Atlantic Hotel, George Simmonds, Church's drug store, John Connors, and others. They will also supply a number of lights for the city on trial, and it is probable that in time the city authorities may deem it advisable to adopt to a certain extent either this or the Brush system, especially in the more thickly settled portion of the city. The parties operating the Brush system are progressing in the work and in a short time will be ready for business. The Brush plant will be located on Middle street, near Fairfield avenue.

Transmission of Electric Force.

M. Marcel Deprez, the eminent electrician, recently gave a lecture at the Sorbonne on the transmission of force to great distances. After explaining briefly the fundamental principles of electrical science, he proceeded to show what an enormous quantity of natural force was lost, simply because the sources thereof were far from towns and railways. The annual unused water-power in France was equivalent to more than 400 times its annual consumption of coal. Through electricity some of this might be conveyed to the large cities. If 1-400th part was used, the number of horse-power would yet be doubled. It was hitherto thought impossible to transport even a small force to great distances with anything like a satisfactory yield, as the greater part of the force developed was wasted in overcoming the resistance of the connecting wire. M. Marcel Deprez was the first to prove that to minimize this loss it was necessary to make electric machines with thin wires, for by this means the wasted energy could be almost made insignificant as compared with the utilized energy. The lecturer then gave an account of experiments performed in Munich, Paris and Grenoble, and announced that next October he would transport 100 horse-power from Creil to Paris, a distance of thirty-six miles. He concluded by publicly expressing his gratitude to Baron Rothschild, who had furnished the means for this experiment.

Electric Light in Trains.

After more than a fortnight's working, without the slightest hitch of any kind, the experiment of the direct electric lighting of one of the District Railway trains between Kensington and Putney, England, may be fairly looked upon as a distinct success. The "plant" is of a rather heterogeneous character, consisting of a launch boiler, a small Willan's three-cylinder steam engine, running at 500 revolutions, and driving direct off its own shaft, and a Siemens shunt-wound dynamo, supplying current for fifty Swan twenty candle-power incandescent lights. In addition, there are two water tanks and a coal box, the whole being placed in a separate van, and this tentative arrangement has this advantage—that by the removal of the van to other lines more extended trials can be made on longer trains, as in the present case only thirty of the lamps are employed for the actual service of the train, the remaining twenty being kept lighted in the van itself. The effect on the train is very brilliant, although the arrangements are not what are ultimately proposed—namely, to place a small high-speed engine and the dynamo on the tender and take steam from the locomotive itself, and so dispense with the attendant now required.

The Electric Wire Cutter.

The apparatus for the cutting of electric light wires invented by Chief Hale was given a thorough test Friday afternoon, and proved to be a success in every way. It resembles the long trimming knives used for trimming trees, and consists of a long round pole, upon the top of which is a knife which works similar to a pair of shears. The handle of this knife extends about three inches from the pole, and to this handle is attached a stout piece of wire, which runs perpendicular with and is attached at the bottom to the pole of the machine. By pressing the handle of the wire against the pole it closes the blades of the knife, and thus the cutting is done. Near the bottom of the pole, and just above the handle, there is a stationary bowl. This bowl is for the purpose of catching the water that may run down the pole in rainy weather, when it becomes necessary to cut wires. The handle below this bowl is hollowed, and the water caught runs down through it without coming in contact with the hand. It is made of pure rubber and insulated. This machine was taken to the Kawsmouth Electric Light Company's office, where Superintendent Weeks cut a wire which was supplying forty lamps without feeling any more effect than if it had been a clothes line. It was estimated that this wire was equal to 150 horse-power. This machine will be of the greatest benefit in case of fires, when electric wires are an obstacle, as they can be easily cut and a gap thus made. The Electric Light Company will put in switches in the near future, so as to switch the current in cases of fires. The Fire Department will be furnished keys to these switch-boxes. If it is sometimes impossible to switch the current, the knife will be brought into active operation, and will be kept as a kind of safeguard in cases of emergency. The wire-cutting apparatus was invented by Chief Hale and made by Ed. Trickett, foreman of the hook and ladder company.—*Kansas City Journal*.

Our contemporary *Engineering*, London, says that an important installation was inaugurated last Monday at the Bank of England, the directors of which entrusted the execution of this work to the Electrical Power Storage Company, limited, the manufacturers of the Faure-Sellon Volckmar accumulator. The installation has been fitted up without interfering with the work of the employes. Progress has necessarily been slow in consequence of the limited periods during which workmen could be employed. It was intended to take the motive power from the existing steam engine and boiler, made by Bolton and Watt over forty years ago, but it was subsequently found to be more convenient temporarily to put down a horizontal portable engine and boiler for the purpose. The dynamo is one of the Victoria type constructed by the Anglo-American Brush Electric Light Corporation. Its electro-motive force is 120 volts, and it is capable of giving a current of 60 ampères. The dynamo charges an accumulator of 55 Faure-Sellon Volckmar cells, which in turn feed 150 incandescent lamps; the latter are distributed throughout the private drawing office, the bill office, and the vaults, the latter having 32 lamps of 20 candle-power. The installation is fitted throughout with Anderson's safety cut-out, which is regulated so as to automatically break the circuit when a certain fixed current is exceeded. High tension Swan lamps are at present employed. The fittings have been manufactured specially by the Electrical Power Storage Company, Limited, and are attached to each gas standard in such a manner as to permit the use of either electricity or gas, or both, at any moment without the one interfering with the other. The whole of the installation has been carried out under the personal supervision of Mr. F. Thornton, the works manager of the company.

The Western Imperial Electric Light Company was incorporated at Springfield, Ill., the 4th inst.

TELEGRAPHIC

WASHINGTON, D. C.—Orders have been given to remove the telegraph and telephone wires from the roofs of the state, war and navy departments building, and place them under ground in conduits already constructed.

The Western Union Company occasionally kills time with wonderful ease in routine business. In 27 minutes recently a dispatch, which Webb had filed in Washington, was transmitted to Boston, was sent by messenger to the *Journal* office, was edited, and was placed in the hands of the compositors.

The following assignments have been announced by the Baltimore and Ohio Telegraph Company:

Eastern Division—E. A. Leslie, superintendent New York City. Lines and offices east of and including Delaware.

Central Division—Charles Selden, superintendent Baltimore, Md. Lines and offices in Maryland, Virginia and West Virginia, including the Main stem, Pittsburgh Division and branches east of the Ohio River.

Western Division—John E. Zeublin, general superintendent Chicago, Ill. Lines and offices west of the Ohio River, including Ohio River bridges.

The directors of the Rapid Transit Telegraph Company, of which George W. Cross, of St. Paul, is president, and W. H. Lightner, of St. Paul, is secretary, have signed a contract with the Baltimore & Ohio Telegraph Company, providing for an alliance offensive and defensive, a thorough interchange of business. Mr. Cross states that a large amount of material has been purchased, and contracts have been let for the construction of hundreds of miles of line as speedily as the weather will permit. The Rapid has all the territory in the Northwest, west of Chicago and through to the Pacific, with San Francisco rights as well. It will establish headquarters in St. Paul and radiate to all important points.

An Important Telegraph Question in Canada.

OTTAWA, Ont.—It is reported that the question as to whether the powers granted to the Canadian Pacific Railway Company enabled that company to do general telegraph business has been discussed by the Ministers. It is claimed by the Canadian Pacific Railway Company that in addition to their powers and franchises as a railway company they are also a telegraph company, without restriction as to amalgamation and leasing, and can do business all over the Dominion without the limitation as to rates enforced by Parliament on the regular telegraph companies. If these powers are as ample as claimed, other telegraph interests may be seriously imperilled. The government by its large subsidies to the Canadian Pacific Railway Company will be contributing toward the practical confiscation of existing telegraph property in Canada by the competition which the Canadian Pacific could thus carry on. Moreover, as their property is exempt from taxation, while that of the other telegraph companies is taxable, they would have an enormous advantage. It is believed that the government is of the opinion that the telegraph powers of the Canadian Pacific Railway Company are limited to the lines and stations of their railway, and that while the language of their charter is very general, it was clearly not the intention of Parliament to give such extraordinary and exclusive powers.

Testing the Wires.

THE APPARATUS WHICH THE PACIFIC TELEGRAPH COMPANY PUT INTO THE HANDS OF RANCHMEN.

The question might properly be asked, how was it possible to keep the lines in working order through the trackless deserts and the mighty cañons, when violent storms or savage depredation often laid them low? This work was performed by ranchmen, not operators, who had been instructed in the use of a testing apparatus, which proved entirely successful.

This testing apparatus consisted of two brass plates, with accompanying brass button, and a ground wire separated from the apparatus, but convenient to be pressed with tongue or finger. When the button was turned the current became broken, and the tester applied a dampened finger to one line, placing the other on the ground wire. If he felt a shock or sensation in his fingers, he would know that a current of electricity existed, and that that portion of the line was all right. If he felt no shock or sensation, he would know that the line was down. The same operation was to be repeated on the other part of the disconnected line.

After testing and finding no current, he was instructed to wait fifteen minutes, testing occasionally during the time; then, if no current was perceptible, he should proceed to get his horse ready to start over the line from which he received no current. Thirty minutes was allowed to get his horse ready for the ride, at the expiration of which time he should repeat the testing operation, and if no current was at that time perceptible, he should start forth on the line as rapidly as possible, always observing that the lines were connected before starting.

When the wires were down on both sides of the testing station, two men, properly instructed, were to start at the same time, one over each line. The hours for testing were 7 A. M., 11 A. M., and 3 P. M. every day. If convenient, tests at two or three other times during the day were to be made as quickly as possible, so as to disturb the transit the least.

These were the general instructions issued to the ranchmen who dwelt alone in the solitudes, and, being faithfully observed, proved eminently successful.

Much might be written of this lone life of the ranchman operator. One of them, stationed all winter on the Big Sandy, near South Pass, was frightened at the sound of his own voice in the spring when calling his horse, which had wandered off in search of sweet grass. Another beheld from the door of his ranch a band of 3,000 wolves cut the hamstrings of his horse, which was grazing near by, and devour it before he could render any assistance. Such was a part of the lone life of the ranchman upon the frontier of the far West.

Foreign Statistics of Telegraph Lines.

The ownership and extent of the telegraph lines in the countries of Europe are not without interest to those who would have the best system of management in the United States, and secure to the people the greatest possible advantage, with the least expense.

Austria Hungary has 35,000 miles of telegraph line and 97,000 miles of wire. The number of telegraphic stations is 3,900. The lines are owned by the State.

Belgium has 3,600 miles of line, 16,600 of wire, and 860 stations, owned and managed by the State. Denmark has 2,200 miles of line, 6,000 of wire, and 300 offices, owned by the State.

France has 49,000 miles of line, 190,000 of wire, 5,500 stations, owned and managed by the State.

Germany 49,000 miles of line, 180,000 of wire, and 10,500 stations, all owned and managed by the State.

Great Britain and Ireland have 28,600 miles of line, 129,000 of wire, and 5,800 stations, owned and managed by the State.

Greece has 3,000 miles of line and 260 tations, owned by the State.

Italy has 17,500 miles of line, and 1,850 stations, of which two-thirds belong to the State.

Netherlands has 2,500 miles of line, 9,000 miles of wire, and 425 stations, owned and directed by the State.

Portugal has 2,800 miles of line, 6,800 of wire, and 225 stations, of which the State is owner and manager.

Roumania has 3,300 miles of line, 6,000 of wire and 150 stations, of which the State is owner and manager.

Russia has 60,000 miles of line, 150,000 of wire, and 3,000 stations, of which the State owns and directs about *seven-eighths*.

Servia has 1,400 miles of line, 50 stations, and the State is the owner.

Spain has 10,500 miles of line, 26,000 of wire, and 1,500 stations, owned and managed by the State.

Sweden has 7,300 miles of line, 30,000 of wire and 550 of stations, all of which is owned and directed by the State, except a limited amount which belongs to the private railways.

Norway has 5.500 miles of line, 10,000 of wire, and 260 stations, mostly the property of the State.

Switzerland has 4,200 miles of line, 10,200 of wire, and 1,225 stations, chiefly owned by the State; the remainder for the use of the private railways.

Turkey has 18,000 of line, 32,000 of wire, and 450 stations, wholly the property of the State.

Thus Europe has 293,000 miles of line, 967,400 miles of wire, and the public is served with 39,100 stations, and nearly all this property belongs to the public.

In the United States there are 142,000 miles of line, 520,000 miles of wire, and 17,500 stations.

Electro-Chemistry.

According to Faraday's law and the experiments of M. Becquerel, a given current of electricity, traversing a series of salts capable of being electrolyzed during a given time, separates at the negative pole weights of the different metals proportional to their equivalents; that is to say, that 107.9 grains of silver being precipitated, the same current will precipitate in the same time 103.5 grains of lead. It will also separate 39.1 grains of potassium and 68.5 grains of barium (as these latter metals decompose water they do not exist free, but are found as a free base round the pole). These different weights are, I repeat, proportional to the equivalents, that is, according to the classical definition, to the relative weights according to which the metals may be substituted the one for the other. In order that they should be proportional to the atomic weights, we ought to obtain in the same time as 107.9 grains of silver 207 grains of lead, that is double the weight actually precipitated; in the same time that it takes to obtain 39.1 grains of potassium we ought to obtain 137 grains of barium, which is not the case in the same way with the electro-negative elements. If we electrolyze in a similar circuit the chloride and oxyde of a similar metal, the weights of chlorine and oxygen set free in the same period are proportional to 35 grains, 5 grains for chlorine and 8 grains for oxygen, that is, to the equivalents. If they were proportional to the atomic weights, we ought to obtain for 35.5 grains of chlorine, 16 grains of oxygen, which is not the case. Without entering into any discussion on the valency of bodies, the idea of which is anterior to the new atomic notation, since it is the result of the discovery of polybasic acids by Graham in 1835, of polyatomic alcohols by myself in 1854, and of glycol two years after by my learned friend, M. Wurtz—without entering, I say, into any such discussion, I confine myself to testifying that Faraday's law is more simply expressed, as a rule, by means of equivalents than by means of atomic weights, both as concerns electro-positive and electro-negative elements.—M. Berthelot, in the *Comptes Rendus*.

Western Union Quarterly Report.

The following statement showing the condition of the Western Union Telegraph Company for the quarter ending December 31, 1883, was issued on Wednesday last:

Surplus, October 1, 1883, as per last quarterly report		$3,841,714 78
Net revenues, quarter ended December 31, 1883		1,655,431 22
		$5,497,146 00
From which deducting appropriations for—		
Dividend of 1¾ per cent., payable Jan'y 16	$1,399,793 32	
Interest on bonded debt	126,420 90	
Sinking funds	20,000 00	
		$1,526,214 22
Leaves a surplus, Jan'y 1, 1884, of		$3,970,931 78
The net revenues of the quarter ending March 31, instant, based upon nearly completed returns for January, partial returns for February, and estimating the business for March, will be about		$1,650,000 00
Add surplus, January 1, as above		3,970,931 78
		$5,620,931 78
From which appropriating for—		
Interest on bonded debt	$106,420 90	
Sinking funds	20,000 00	
		$126,420 90
Leaves a balance of		$5,494,510 88
It requires for a dividend of 1¾ per cent. on the capital stock		1,399,800 00
Deducting which, leaves a surplus, after paying dividend, of		$4,094,710 88

In view of the preceding statements, it was resolved that a dividend of one and three-quarters per cent. on the capital stock of this company be declared payable on and after the 15th of April next to shareholders of record at the close of the transfer books on the 20th of March instant.

A New Submarine Telegraph.

The Canary Islands, a Spanish possession on the west coast of Africa, are now connected with the continental telegraph system of Europe, by means of a cable extending from Cadiz to Teneriffe. The laying of this cable, which has just been inaugurated, has been undertaken by an English Company—the Spanish National Submarine Telegraph Company—which obtained a concession from the Spanish Government and negotiated with the India-Rubber, Gutta-Percha, and Telegraph Works Company for the laying of the new submarine communication.

The points telegraphically connected are Cadiz and Santa Cruz de Teneriffe, Teneriffe and Palma Island, Teneriffe and Gran Canaria, Lanzarote and Gran Canaria. On its part, the French Government has addressed itself to the English Company in order to have the Spanish cable extended from Teneriffe to St. Louis de Senegal. The distance from the latter point to the Canaries is about 800 nautical miles.

By the terms of the convention signed at Paris, and which has received the approbation of the two Chambers, the company is to lay this cable and operate it for twenty-five years. Communication between the frontiers of France and the point of landing of the cable in Spain will be secured by means of a direct wire that traverses the Spanish Continent and is specially set apart for such traffic. The tariff from France to St. Louis is fixed at two francs fifty centimes per word, including the charges of transit across Spain. This is a very small charge, the tariff having been up to the present four francs per word for submarine transmission from Lisbon to St. Vincent alone.—*La Lumiere Electrique*.

Telephonic News

Since the new year came in, when the New York and Pennsylvania Company took charge of the telephone business in Erie, nearly fifty new subscribers in the city and suburbs have been connected with that exchange.

The average cost of a well-built telegraph or telephone line, say of No. 8 galvanized wire, with 35 poles to the mile, we estimate, including the cost of setting the poles, stringing the wire and transportation, at $165 per mile.

A correspondent asks, "What measure of success has the Drawbaugh Telephone Company, of Philadelphia, met with in securing stock subscriptions?" There is space in this column for anybody who can answer. No local information is obtainable as yet upon the point.

The Boston Exchange is almost entirely recovered from the effects of the storm two weeks ago, during which time a dozen new fixtures have been put up, in place of those disabled, and fifteen or twenty miles of new wire run. When the repairs are completed, the plant will be in first-class shape.

The following employes of the Bell Telephone Company, of Philadelphia, have resigned to take positions in the Clay Commercial Telephone Company, of Philadelphia: E. W. Carritt, Cashier; F. A. Smith, Book-keeper; J. A. Palmer, Treasurer; E. Jordan, Chief Clerk; Miss Sadie Baldwin, Clerk; C. M. Root, Supt. Operating Dept.; Howard E. Root, Mechanical Engineer.

There is a steady growth of subscribers in the exchanges of the New York and New Jersey Telephone Company, which company is now prospecting southward with a view to opening communication with Trenton and Philadelphia in the near future. Five years from to-day it will be difficult to find a city or even a town of five thousand inhabitants that is not connected by telephone lines with all its neighbors within a hundred miles.

It seems that the People's Telephone Company, the parent Drawbaugh Telephone Company, controlling all the sub-telephone companies proposing to work under Drawbaugh's alleged inventions, reports from its office at 115 Broadway, New York, to the State authorities at Albany, officially, that "the People's Telephone Company has no earnings and its stock has no value," meaning, of course, upon the basis on which the reports are made.

Erie, Pa., and other cities and towns along the lake are rejoicing in long-distance telephonic communication, recently established. The newspaper articles which chronicle the opening of the new lines of the New York and Pennsylvania Telephone and Telegraph Company sound to more Eastern parties like the echoes of an old song, so pleasant is it to be within helloing distance of your neighbors fifty to seventy-five miles away. Progress is the word.

A Protector for Telephones.

A novel device was exhibited recently at the Brush Electric Company's establishment on Lancaster Street, Boston, by the Telephonic and Telegraphic Protector Company, of New York, before Supt. of Fire Alarm Flanders and his assistant, Mr. George, the electrician of the Board of Underwriters, and other gentlemen. The protector was placed in circuit with a telephone, and a powerful current (thirty dynamos) was turned on it at full force. The protector carried the surplus to the ground, protecting the telephone. The current was sufficiently strong to burn all the telephones in Boston.

An ordinance has lately been passed by the General Council of the City of Louisville, Ky., granting to the Ohio Valley Telephone Company permission to lay underground pipes, cables, conductors, and wires.

By the first article of the ordinance the company is granted permission to construct, maintain, repair, and operate in the public streets, avenues, alleys, and sidewalks of the City of Louisville, for the term of twenty-five years successively from the approval of the ordinance, pipes, cables, wires, and other conductors, together with all the necessary testing stations and other attachments and appurtenances for the purpose of transmitting sound, signals, and telephonic communication by means of electricity.

The third section provides that the company shall make no excavation whatever without first obtaining written permission to do so from the city engineer; and the fifth, that the streets, after being torn up by the telephone company, shall be restored to his satisfaction. In case the city engineer refuses to approve the manner in which the streets are restored, the work can be taken in hand by the city and the cost of restoring charged to the company.

Section sixth provides that the work of construction on the underground system shall begin within six months.

The seventh section gives the city the right to lay wires in the company's pipes and conductors for the fire and police service of the city, without charge; and this section also provides that in portions of the city where telephone pole lines are used by the company, the city is to have reserved for its use the top ten inches of said poles, free of charge, for its fire and police service.

The company is compelled, by section nine, to execute a bond for $50,000, with satisfactory security, as a guarantee that it will faithfully observe the provisions of the ordinance.

The company does not receive any exclusive right to put down an underground system.

A very similar ordinance was passed at the same time, granting to the Louisville Underground Conduit and Electric Light, Telegraph and Telephone Company the right to construct, lay, maintain, use, and operate in the City of Louisville, and along and under the public ways of the city, conduits and pipes, wires, cables, conductors, testing stations, and necessary connections, fixtures, and appliances for the transmission of messages, sounds, and signals, and the production of power, heat, and light by the aid of electricity, etc.

The ordinance mentions that the McGrew patent may be used, and provides that other companies may use the underground way on payment of a fair compensation.

No exclusive right is granted to this company.

He Commenced Right There.

What a pity the telephone is such a fickle institution. Among its thousand and one peculiarities, its disposition at times to refuse to *work* has caused internal and external strife, and bursts of forcible oratory, known in variety and volume by no one better than the average exchange manager. Ignorance and negligence on the part of subscribers, together with natural causes, pile up *trouble* and urge the necessity of employes of both high and low degree to exert their little help in perfecting, as near as possible, the system they are part and parcel of. The St. Paul, Minn., exchange had—but now has not—a subscriber *who*, unsuccessful in calling the central office through his instrument, took the following novel and original method of wreaking his vengeance:

Failing to get a response to his continuous calling, the party, a leading druggist, procured an axe and deliberately smashed transmitter, battery-box, battery, and outfit into a shapeless mass, then walked into the superintendent's office and reported what he had done. The outcome of the affair was a private settlement rather than legally respond to charge of malicious mischief.

The Kansas City telephone service has made marked progress in the last twelve months, and now ranks among the best in the country. At the time the Missouri and Kansas Telephone Company purchased this exchange in the fall of 1882, there were 276 subscribers. At the present time there are 500 subscribers, and applications are being filled at the rate of about 40 a month. All the leading hotels in the city are telephone subscribers, and they freely speak of the improvements in the service since this company took charge, which has amounted to an entire reconstruction, introducing new instruments, multiple switchboards, etc. Additional lines will be constructed this season, so as to embrace all parts of the city and suburbs. With such competent management as that of E. L. Smith, general superintendent, and Chas. W. Price, manager of the exchange, it is more than likely there will be one thousand patrons of the telephone in this city by Jan. 1, 1885.

The New England Telephone Company.

An item appeared in a Boston paper on Sunday, stating that it was possible the New England Telephone and Telegraph Company would pass its next quarterly dividend, which is payable about April 25th. The reason given was that the company could not sell its treasury stock at a satisfactory price to carry on the construction, and the earnings must consequently be used for that purpose. It is a fact that the company would not be willing to dispose of its treasury stock at such a low price, but there are other ways out of the difficulty, and no good reason appears why the dividend need be passed.

It is stated on good authority that the company is earning at the rate of six per cent. per annum, net, upon its full-issued capital, and is daily increasing by the addition of new subscribers, over one thousand net having been added since the consolidation in October last. Of course it costs something to add a thousand subscribers in four months, an average of ten for each working day, and if treasury stock cannot be disposed of at satisfactory prices, why would it not be well for the company to make a loan? It certainly has in its property and board of directors sufficient credit to borrow all the capital necessary to put in the new subscribers.

Adding subscribers and increasing the plant is similar to a manufacturing company building a new mill, and very few, if any, companies build mills from their earnings, unless the earnings are sufficient above a fair dividend to warrant their being used for this purpose. The question arises, why not stop the construction? This is virtually impossible, as the company could not consistently refuse to put in a telephone if applied for; and, again, the systems being well spread over the various cities and towns, the expense is less of connecting subscribers, and the return warrants the outlay; while passing a dividend would cause but temporary embarrassment to some, and would increase the value of the property.

The New England company can afford to borrow for their construction, for a while, and continue paying their 1½ per cent. quarterly dividends; and with the general increase of earnings, the time would evidently be near at hand when there would be sufficient earnings to continue the dividends, carry on the construction, and reduce any debt contracted.

It was decided by Judge Ingraham, in the New York Superior Court, March 1, that the poles and wires erected by the electric light companies for the purpose of lighting the streets, under contracts with the city authorities, were not obstructions of the streets in which the city holds the fee of the land, and that their presence was consistent with the public use of the streets.

An electric bouquet was presented to the Crown Princess of Austria, a short time ago, at Vienna, which consisted of a group of snowy globes, inside of each of which was an incandescent lamp, fed from small storage batteries in the vase. The capacity of the battery was found sufficient to maintain a brilliant illumination for three days.

Serious Interruption of Business In and Around Boston.

"When are you going to get our machine working?" said a young man to Superintendent Chapman, of the New England Telephone Company, yesterday afternoon. Turning to the record-book, which lay on a shelf at his right, Mr. Chapman said, "I can't tell. But that isn't just the right way to reply to a question of that kind. We are trying to clear away the wreck caused by the storm, and shall get your line working just as soon as possible. We are doing all we can to shorten the time of the inconvenience to which our subscribers have been subjected by reason of being deprived of the use of their telephones." With a "thank you," the young man left, and Mr. Chapman, picking up a letter from his desk, read, "Our telephone has not been working for several days. Are you going to fix it?" Hardly had he finished reading when the door opened, and in walked another young man. "I am from the B—— 8—— R——. You have received a letter from Captain T——. Well, it's the private line we are most anxious about. You know we do most of our business by telephone now, and being deprived of its use, it is very inconvenient. A messenger, running all day, would not take the place of the telephone." "I think we will have your line all right this evening," said the Superintendent; "the men were at work yesterday, and have been to-day. We'll have it all right in the morning, anyway." As the young man left, Mr. Chapman said to the writer, "You ought to have been here for the past few days. You would have enjoyed the conversation hugely, and would have been interested to know just how anxious the people are to have their lines in working order. Like many other things, the benefits of the telephone are most appreciated when people are deprived of its use." Continuing, he said: "The storm of a week ago was the most destructive to telegraph and telephone wires ever experienced in Boston, and the storm of Saturday only helped to retard the progress we were making. We had 900 wires down after the storm, and we have now about one-half of them repaired and in working order. Every man that could be spared from the outlying divisions of New England has been brought to the city. We have 80 men at work in the city and the near suburbs. The storm of a week ago did but little damage outside of Boston, but that of Saturday played mischief with the lines in the suburbs, thus increasing the labor of the men. The delay in the city is mainly due to many of the permanent fixtures being broken down. These had to be reconstructed before the lines could be put in position. In replacing the fixtures and putting the wires in position the property-holders have been remarkably free in granting rights of way, which is greatly appreciated by the company as well as by the public. The Trunk lines are working to Lowell, Lynn, Salem, Brockton and Providence, and by the last of the week the company expects to have all the lines in and out of the city in as good working order as they were before the storms." It is estimated that the damage caused by the two storms will amount to upward of $15,000. Speaking of the causes which led to the prostration of the lines, Mr. Chapman said that rain continuing for 48 hours would so completely saturate the covering of the wires as to destroy, in a great measure, the insulation, water being a good conductor.

"Give me a telephone cigar," said Colonel George Leander yesterday, as he stepped up to the stand at the Astor House.

"What kind of a cigar is that?" inquired the unsuspicious proprietor.

"One of the kind that you smoke in New York and they can smell in Brooklyn," was the answer.—*H. B. L., O'd Guard.*

At Ripley, Ohio, the river was four inches higher than ever known. A lady telegraph operator, perched on the roof of the house, remained at her post till the wire ceased to work.

Telegraph Communication Between Denver and Pueblo, Col.

AN IMPROVEMENT THAT WILL BE APPRECIATED BY BUSINESS MEN OF BOTH CITIES.

Scientific improvements are constantly being made all over the country, and among the latest and most important to the people of Denver and Pueblo is the binding of the two cities by a wire line, by means of which the citizens can converse at leisure. About the 1st of last December the work of running a telephone line from Denver south was begun, but work was necessarily delayed in consequence of the severe storms of the past winter. Work was resumed about the middle of January, and yesterday was completed. In order to make the enterprise a success, the very best material has alone been used, and the route of the old wagon road was selected in preference to the railroad, in order to avoid induction as much as possible. The usual No. 14 wire, which is in service throughout the city, was discarded, and in its place No. 9 has been substituted, and the clearness of sound with which the speaker is heard at either end proves the wisdom of this change. The wire extends 111 miles from Denver, and is strung on 2,619 poles.

The cost of construction of the line will reach nearly $13,000.

Our representative called on Mr. E. B. Field, acting manager of the Telephone Company, last week, and by him an opportunity was given the newsman to test the wire. Pueblo was called up, and the congratulations were sent the southern metropolis. Instantly a clear and distinct "Thank you" was received, and it was difficult, indeed, to conceive that the speaker was over 100 miles away. The advantage of this telephone line will be great to the merchants, as well as the professional men of both cities, and will doubtless be extensively used henceforward.

THE RATES TO BE CHARGED.

Mr. Field stated that the rates exacted for using the line will be: For a five minutes' talk with Colorado Springs, 40 cents; same with Pueblo, 60 cents. These figures are considered very reasonable, for business men can say all they wish to in the time allotted, and will, of course, have the advantage of talking each way, instead of being compelled to telegraph as heretofore. Another advantage offered is that one does not have to pay unless he can talk to the person he telephones for, while the company will send for any one desired, charging only five cents where the person can be found within a mile of the central station at either end of the line, or at a corresponding rate for a greater distance.

Already the business men are appreciating the accommodation, and scrip was issued to those who had previously subscribed for the stock of the company. By means of this new line telephonic communication will be had with Manitou, as there has been for some time a line connecting the Saratoga of the West with Colorado Springs, and connection will be made at the latter point with the Pueblo circuit. This will connect Denver and Manitou, and this fact alone will prove of great advantage and convenience during the summer months.

THE DENVER SYSTEM.

It may be of interest to the reading public to know that the Denver telephone system now covers a radius of over 100 miles, and the capital is now on speaking terms with over half the population of the entire State of Colorado. Nor is the work yet completed, for there has been talk, for some time, that Leadville will be connected by telephone. Should this task be accomplished, it will be by overcoming difficulties far more serious than any encountered thus far. It is practical, however, and in all probability the work will be completed during the coming summer. The business men of Greeley and Fort Collins are desirous of being similarly connected, and very soon the active work of constructing the line will be started.

The Economy of the Telephone.

A German contemporary, the *Daheim*, says that when Alexander Graham Bell invented the telephone, it not only excited curiosity but it proved so successful that it took a high position in public and private life. Rural Post offices are now connected with the nearest telephone exchange which the public may use at low rates and without being obliged to know how to telegraph. In cities where a large business is done might be seen all over the streets big spans of wires which serve the public. The telephone may be looked upon as an ordinary instrument, for no doubt most of our readers have used it as the opportunity is often offered to them.

The telephone may be used to convey musical sounds at a distance, and loud tones cannot alone be heard but also the soft music which may be brought forward by singing, and that is how the idea originated to connect a full orchestra by telephone. One of this kind of experiments was made during the Electrical Exhibition at Paris, which resulted as in other cases, very successfully. The Opera House was connected with the exhibition hall, and transmitters were put up near the orchestra. Very soon thereafter and in the same manner the opera house in Berlin was connected with the telegraph office at the same place, but only a few persons were admitted to witness the experiment, but later an office was furnished by the Philharmonic Society by which the public could listen to a concert by telephone. The concert hall being near the telephone office the wires were coiled and taken considerably out of the way to increase the distance. This experiment has got so fashionable now that at all the electrical exhibitions the telephone is used for conveying music from the concert hall or opera house. Our illustration shows the interior of the Philharmonic Society telephone office in Berlin, and some attentive listeners who are holding the receivers close to their ears so as not to let one sound of the orchestra escape their hearing, the artists are performing their duty in full vigor. The wires on the left hand side of the picture lead to the transmitter, which are put up near the orchestra. The effect of the music is brought forth without the loss of one note, even of a Wagner composition. The music is dampened and it sounds as if the orchestra were divided by a thin wall from the listener, but no note is missed and no sound is lost, provided the transmitter be put near to the orchestra. We had occasion during the electrical exhibition at Munich to listen to one act of "Tannhauser" by telephone in the exhibition building, which is a half mile distant from the opera house. Before the orchestra commenced playing the voices of the audience could be heard, the tuning of instruments, and the noise caused by the chairs being dropped to seat the audience. Then the music began as if from a far off place, the sound was conveyed to my ears, the piano deceived me the most as to the distance, but the crescendo seemed to move the orchestra nearer till at last the sounds seemed to come from behind the wall. If you look on the floor during listening you think the orchestra under you, but at looking up you will transplant them over your head; by closing your eyes the sound is heard as from the mystical depths of the Bayreuther Wagner theaters, and the imagination may form the most ideal scenery to the music. If the music lover would study the music with his eyes by telephone an enjoyment hitherto unknown to most people would present itself. He could have a telephone put up at his home and could listen attentively and without disturbance to the music, providing the transmitter was put near the orchestra at the opera house. Not alone the music of the orchestra can be heard through the telephone, but also the songs of the actor and his expressions. Herr von Perfall, the manager of the theater at Munich, has a telephone line built from the theater to his villa at Tutzinger on the Starnberger Sea, and there he not only listens to the play, but also to the applause of the public. Even the places taken by the actor can be determined, for on turning to the right your right ear will hear better than the left, on turning to the left the reverse. The most remarkable of all were the experiments made on the telephone line between Munich Tutzing on the Starnberger Sea and Oberammergau, the length of line being ninety-five kilometers. In Oberammergau, where the pupils of the school were rehearsing for the passion play, the songs and talking were heard plainly. During the day the teacher spoke to the people in Munich, or played for them on the piano or violin. In the evening the actors met the teachers, and sang, which was heard very plainly.

LISTENING TO THE OPERA AT THE PUBLIC TELEPHONE OFFICE.

In Tutzing at the house of the inspector of the glass palace, a little distance from Oberammergau, the inspector's wife was stationed at the telephone, and the following dialogue ensued: The inspector calls, "Kate, there are some men here in Munich; can you sing a song with the teacher for them?" Pause—following this we hear the lady talking with the teacher: "Are you there, teacher?" she says; "Yes," he answers, "what do you want?" "I would like to sing a song—you to take second voice," she says. "I shall be very glad," he answers. Upon that the lady begins the song, and the teacher soon joins her; and we hear a duet, the principals of which are three or four miles apart. To fill the song the inspector goes to the telephone and sings third voice to the song, and we have trio, the singers of which are in Oberammergau, Tutzingen and Munich—distance ninety-five kilometers. Had not the telephone been used for above purposes were it might be looked upon as a theory, but it is true; the above experiments have all proved successful, and we advise all our readers to listen, whenever they may get the opportunity, to a concert by telephone.

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A Characteristic of the Late Compte du Moncel.

Every day brings us letters from various parts of the country asking for information regarding this or that system of electric lighting, or transmission of electrical energy, or storage of electricity, Most, indeed nearly all, these letters are written by intelligent men, who have a real desire to acquaint themselves with contemporary electrical science; no doubt, in many cases, with a view of investing money.

Looking over these letters, the question naturally arises "Why don't the writers buy the scientific works of the day and inform themselves?" We don't mean by this that we are not inclined to assist them. On the contrary, the giving of such information is a specialty with us, and our many patrons may always look to us to make clear any points concerning electrical science, both pure and applied, which has already been developed.

But the reason some of our correspondents don't read electrical works is that many authors of the same talk as though they were talking to scientists. It is, as we know, a rare gift to be able to explain lucidly and clearly that which is founded upon a basis of pure science, but it can be done, generally speaking to an auditory of intelligent persons with some slight knowledge of the higher mathematics. But many of the writers of the day upon scientific themes are unnecessarily prolix and involved.

We maintain that a writer upon scientific topics, with the idea of explaining them, should never take it for granted that the reader is an accomplished mathematician and physicist. He should explain carefully as he goes along.

The late Comte du Moncel furnished a striking example of how clear even scientific subjects could be made to the general reader He is always clear, always concise and lucid, never using a word of two syllables where a word of one syllable will express his meaning. His *Expose des Applications de l' Electricite* furnishes a striking example of this; and although this work has become superannuated, owing to the rush of invention, it is yet valuable as a guide to the student, and as a record of achievements, and a repertory of ingenious devices. Du Moncel is perhaps best known in this country by two small but excellent manuals, viz., *L'Eclairage Electrique*, and his *Microphone, Telephone* and *Phonographe*. The completeness and lucidity with which he treats these various subjects reveal at once the scientist perfectly at home with his subjects, and expounding them for the pleasure it gave him.

One of his last publications was the outcome of an investigation as to the best method of constructing and winding electro-magnets. It is entitled *Determination des Elements de Construction des Electro-Aimants.*

Compte du Moncel was rightly regarded as something more than a scientist; he was a savant; and the pages of the *Comptes Rendus* give evidence of the character of his mind and the thoroughness of his work. His merits were happily recognized by the French Institute of which he was a member.

Telephonic Progress in this Vicinity.

The New York and New Jersey Telephone Company is one of the most active and energetic of the companies recently organized, covering, as it does, the best suburban territory in the United States, and including the third city in the Union. The growth and development of the business stands unrivalled. The present management, under their able president, Mr. C. F. Cutler, have succeeded in systematizing and pushing the business in a way that has produced most astonishing results, and proves the advantage of the right men in the right places.

Starting in October, 1882, with 2150 subscribers, they now have 4,160, an increase of 95 per cent. These subscribers are distributed amongst 35 towns, 15 of which have been opened since that date. Trunk lines are built and building all over the territory, embracing the following principal towns in Long Island and New Jersey: Flushing, College Point, Whitestone, East New York, Jamaica, Babylon, Rockaway, Paterson, Orange, Plainfield, New Brunswick, Elizabeth, Newark, Jersey City, Rahway, Perth Amboy, etc., etc., and during the coming season will be extended to Trenton, N. J., and Easton, Pennsylvania, thereby completing a reticulation which includes all the towns within a radius of 60 miles from New York City; and since all the channels of traffic and trade lead to the future Cosmetropolis, just as in ancient times all roads did leap to Rome, these lines are sure to be occupied to their fullest extent in the transmission of intelligence, and will add materially to the growing revenue of the company.

The popular and convenient summer resorts in Long Island and New Jersey, including the seashore and Orange Mountain, will be amply supplied with telephonic communication. The weary pilgrim may breathe the fresh air of the mountains, or the salt air of the ocean, and while bathing in its health-giving tide, may be whispering messages to the busy marts of trade, and thus not lose the floods in those tides of business that lead to fortune. The advantages of such speedy and satisfactory communication as is afforded by the telephone is but half appreciated, because not tried to the extent it deserves, and the recent development of facilities to meet the demand that is sure to come must be appreciated by the public.

The Trust in Providence Telephone Company.

As long as the organization known as the People's Telephone Company contented themselves with an endeavor to maintain what they claim to be their rights before the courts, we had nothing to say; but now, when they essay to sell stock in what, until legal proof to the contrary is adduced, might be regarded as a somewhat speculative project to say the least judging from its reports and doings, we do without any animus on the one hand, or fear upon the other propose to give a clear account of their claims as far as we are able to learn. We are informed that a gentleman doing business in the West whose name has been furnished us, says that he was induced to invest in the stock of the so-called People's Telephone Company. This stock, he says, was represented to be of the description known as "Treasury" stock. The amount of his purchase was several thousand dollars.

Subsequently he learned to his amazement and consternation that this stock had been unloaded upon him by some of the Drawbaugh syndicate. To prove the matter, he gave his lawyer a power-of-attorney to act for him, and clothed with this authority, the latter demanded permission to look at the company's books. From this inspection he learned that the suspicions of his client were only too well founded.

Contrary to agreement, the representative of the company had not sold his client any treasury stock at all, but, as had been surmised, sold him some of the stock which had been held by interested parties. Whereupon it is said the lawyer notified the company that he would give them until noon upon the following day to make restitution of the money his client had been led to pay through misrepresentation. To this demand they at first strenuously demurred, but the lawyer threatening to bring them within the clutches of the law, they were induced to take a more reasonable view of the matter, and, before the time given them for a decision had expired, they returned the funds. This lawyer, it is said, reported to his client, that his inspection of the company's books showed that it had received for stock only *four hundred and fifty dollars.*

That this somewhat inconsiderable sum it seems represents the amount of cash paid in to the People's Telephone Company, the parent Drawbaugh Company, controlling all the sub-telephone companies professing to work under Drawbaugh's alleged inventions, is proved by the official report made by the treasurer and secretary of the aforementioned company to the State authorities at Albany.

Here are parts of this report:

"Total authorized capital of company, $5,000,000; whole number of shares of stock authorized, 100,000; number of shares of stock issued, 100,000; par value of each share, $50; amount paid into the treasury of the company on each share, $50; amount of capital paid in, $450 cash and $4,999,450 in patents and patent rights; amount of capital upon which dividends were declared, no dividends declared; date of each dividend declared, no dividends declared; amount of each dividend declared, no dividends declared; rate per cent. per annum of dividends, no dividends declared; amount of profit added to sinking fund, none."

This report, as will be seen, is not such as is likely to serve to encourage investors. Messrs. Solomons' and Loth seem unable to fix a value, estimated or otherwise upon the $4,999,450 in stock that has been issued for the patents and patent rights. Indeed Mr. Solomons seems Loth to tell what the patents in question consist of, to give the names of the persons to whom the stock has been issued, to confess why no value has been placed upon it or say whether or not any of it has been negotiated. If the latter is the case, he has made no official record of the proceeds it seems.

But let us see what was the ostensible purpose of the organization at its inception; let us see if the object of its organization was, in reality, to do a telephone business as is claimed by its incorporators.

"The People's Company was organized under the laws of the State of New York, with a capital of $5,000,000, which, it is said, was issued to three persons for patents and claims to patents. The company at first owned patents of Klemn and Tisdell, and the suit brought by the Bell Telephone Company three years ago was defended upon other grounds than Drawbaugh's inventions. The present injunction stands against the People's Telephone Company, and does not affect any of Drawbaugh's alleged rights. It is understood that those to whom the stock was issued, pooled 67,000 shares of the 100,000 shares with a New York trust company. They then set to work to force the Bell Telephone Company to purchase this controlling block of stock at an enormous figure, and an office was opened in Boston, near the Bell Telephone Company so that a transfer of all the assets could be readily made for the expected cash. But the Bell Company refused to negotiate. As the People's Company was at large expense to maintain a standing in the courts, it issued three contracts, selling out all the territory of the company for cash and a stock interest. One contract was for the New England States, and upon this the New England company was formed, with a capital of $5,000,000. It is said that "four Western States were given to one director, and the balance of the United States made over to what was called the New York syndicate through a son of one of the directors in New York." These contracts licensed exclusively all the property owned by the People's Company, or hereafter to be acquired by it, to the several parties on a royalty basis of $7.50 per set of telephones and one-fifth of the capital stock of the sub-companies."

Thus, as will readily appear, the company had other objects in view than to absolutely go into the telephone field. There was a chance, and no doubt to some of its incorporators the chance seemed a good one, that the Bell people would become stampeded and buy them out.

"The New England company paid about $50,000 cash for its rights, of which it is said that only one-half reached the treasury of the company. The four Western States netted the company about the same amount, and the New York syndicate controlling the balance of the territory of the United States agreed to pay some $200,000 for its contract. The actions of this syndicate are something of a mystery yet to be fathomed. This syndicate owns the territory for which the Drawbaugh Telegraph and Telephone Co. was organized with a capital of $15,000,000. It

is said that $10,000,000 of its stock goes to the syndicate for its rights. The public are invited to buy the balance at $15 per share, and in the advertisements offering a "limited amount" of this stock for sale, the names of eleven directors are printed as 'the directors of the company.' It is said, however, that there are upwards of twenty directors, and that only the prominent names are put forward.

"All the efforts of the company to sell out to the Bell Telephone Company proving unavailing, the promoters made a great stir over the pending lawsuit, and, after having sold all the territory to the three organizations above mentioned, they offered the 67,000 shares of stock at a 'low' price to the Bell Telephone people. They negotiated through a prominent Boston firm and offered the whole block of shares for about $1,000,000. This they thought a very modest price. What the Bell Telephone people thought is not known, further than may be judged by their action in refusing to negotiate with a company that had nothing to sell. This was a serious rebuff for the People's Telephone Company, but they were by no means beaten yet."

It is unnecessary here to go over the claims of the so-called People's Telephone Company; it has been well and often done in these columns.

From this the readers of the REVIEW all over the country can get something of an insight into the organization of the People's Telephone Company as far as we are able to ascertain.

The Future of the Electrical Launch.

That there is much to say for and against the electrical launch, no one will deny who knows anything at all about the subject. The virtues of the electrical launch may be said to lie in its convenience and adaptability, and its faults in its expense. As explained in a recent number of the REVIEW, the trials that have been made have proved satisfactory in every way, save that regarding the expense account. Nor have we sufficiently numerous records of work done and money paid to enable us to arrive at an accurately-computed estimate of just what electric launches cost. The fact is that the cost of the electric launch varies, depending much upon the cost of steam power for the driving of the dynamos which are to charge the storage batteries and the cost of labor. Mr. Reckenzaun, the well-known authority, says that electric launches are not a modern invention, but have not been used before simply by reason of their expense. He says that as long ago as 1838 Professor Jacobi drove a boat by means of a primary battery and an electro-magnetic engine; and somewhere about 1850 an electric launch was tried on a lake at Penllegaer, near Swansea, under the direction of Mr. Hunt and Sir William Grove, who were the designers of the boat and machinery. Several other experimental trials are on record, but until Trouve in 1881 started his boat Eureka on the Seine the expense of working electric launches was practically prohibitive. The improvements effected in the dynamo effected by Gramme and Siemens have, however, brought the question again prominently to the fore, and the point to be decided now is whether the primary or the secondary battery is the cheaper source of energy, all things considered, as applied to the work of driving an electric engine.

Mr. Reckenzaun looks upon the ordinary zinc battery as being out of the race, as opposed to the secondary battery. But we must confess we think that the primary battery, though, as he says, more expensive than the secondary battery, has, nevertheless, much to commend it.

It requires by no means as much attention as the secondary battery, and is in many other ways more convenient and more to be desired.

Mr. Reckenzaun says: "What with cleaning, amalgamating, mixing the solutions, and refilling a battery capable of doing six or seven hours' work at the rate of five electrical horse-power per hour, one man would find plenty of occupation for a whole day, even with the best appliances; but the same amount of labor might be expended on a six-horse steam engine, and a dynamo for charging fifty accumulators, each of a capacity of 370 ampère hours, or one horse-power hour. That would give nominally five horse-power for ten hours; but it is never advisable to run a secondary battery right down, so Mr. Reckenzaun takes seven hours as the duration, and reckons the cost at 2s. 9d.; whereas the cost of zinc alone, in a primary battery supplying two electrical horse-power for seven hours, would be 17s. 6d."

It is safe to say, as we have before explained in the columns of the REVIEW, that, as an electrical launch has never yet been got ready under favorable conditions, we do not know just what the cost would be, nor how effective it might prove.

Let us suppose that there were established at different points along the Hudson River, from New York to Albany, a series of electrical charging stations.

An electrical launch can readily carry a storage of electrical energy sufficient for a run of seven hours; indeed, ten hours' work is easily taken with it, but it is not a good plan to entirely exhaust storage batteries, and hence we have said seven hours. Now, it has been said that no one would care to wait several hours while the boat, after running up the river seven hours, was stopped to have its accumulators charged. On the contrary, we think after a number of persons had traveled for seven hours in a launch of any kind, they would be quite ready to wait over for a few hours before proceeding; and it would be at this time that the launch could be recharged.

Again, it should be remembered that the storage batteries are continually being improved; indeed, there are some improvements that have recently come to our ears which, if correct, will almost double the efficiency of the accumulators; but of the certainty of this we are not able to speak, since we have not seen them in operation. But, even taking the ratio of progress in the improvement of the accumulators to be in the near future what it has been in the recent past, and the time is not far distant when the electrical launch will be a reality, economical as well as efficient.

We hope it will soon come.

Underground Wires.

Our esteemed contemporary, *Bradstreet's*, recently published the following interesting article on the above topic:

* * * What is needed now is a careful consideration of the problem in all its bearings, and the adoption of a system as the outcome under which electric expansion can go on in security.

In current discussions of the matter in the daily press, the electrical questions involved in the use of underground conductors for telegraphic and telephonic purposes are usually lost sight of, and it is presumed that the conditions which answer well enough for electric light conductors are equally applicable to the others. Insulation appears to be regarded as the main consideration, whereas this at present offers no special difficulty. The cardinal difference between electric light and telegraphic currents is that the former is continuous, while the latter consists of a succession of impulses of varying strength. This difference makes a very great one in the condition under which the two set of conductors can be successfully operated. All telegraph and telephone lines are subject on this account to two disturbing influences from which those of the electric light are free. These are what is technically termed "retardation" and induction. A conductor encased in an insulating coating and buried in the earth presents the conditions present in the Leyden jar or ordinary condenser. It is consequently capable of becoming statically charged, the surface of the conducting wire receiving a positive and that of the surrounding earth in contact with the intervening "dielectric" a negative charge. When the current sent through the line by a battery or other source of electricity ceases, and either or both ends of the conductor are connected with the earth, the line discharges—that is, the two static charges—combine in the same way as in a Leyden jar when the inner and outer coatings are connected together. The positive electricity accumulated upon the wire flows to earth throughout the whole length of the wire in one direction when only one end is grounded; from the middle both ways when each end is connected to the earth.

As every actual line possesses resistance, this discharge takes time, and it prolongs the signal due to the first impulse, so that it becomes merged into that of the following impulse if this be sent before the complete discharge has taken place. There is, therefore, a limit to the speed with which signals can follow each other and be distinguishable, and this is evidently dependent upon the resistance and length of the line, and upon its capacity to receive a charge, since the greater the charge the longer it will take to dissipate. This capacity depends upon the surface of the conductor, the nature of the intervening dielectric, and the nearness of the external conducting body. In naked air lines retardation is much less marked than in underground ones, as the line is a considerable distance from the earth, and the intervening dielectric—the air—is of low inductive capacity. All insulators which can be used on subterranean lines are of considerably greater inductive capacity than air, and this, combined with the nearness of the conducting earth, greatly intensifies the retardation effects.

The second influence—that of induction—is the well-known action of one wire carrying a current upon another lying near and parallel to it. Whenever the current starts, stops, increases or diminishes, it induces a current in the neighboring conductor, so that the signals on one line can be heard on those adjacent. This difficulty is much greater on telephone than telegraph circuits, but it can be largely overcome by the use of a complete metallic circuit—that is, by carrying a return wire along the out-going one. Any induction then due to an external circuit produces equal and opposite currents in these two wires, which destroy each other. The return wire is not feasible, however, on that part of a telegraph circuit in a city alone; it would have to extend the whole distance from one city to another. These considerations serve to show that the reluctance of telegraph and telephone companies to place their lines below ground is not based solely upon the expense, but rests upon substantial electrical reasons.

Both on account of the electrical difficulties and the objection to the incessant tearing up of streets, it does not seem probable that any system of underground conduction will prove satisfactory short of that involving the use of a subway. This would allow of inspection, repair, and additions without any disturbance of the streets, while it would furnish conditions more favorable for the efficient working of the lines than any manner of trench. Such subways, built expressly for this purpose, would doubtless be costly; but if all the companies engaged in electric service combined in constructing them, the expense to each would not greatly exceed that of laying separate trenches. Moreover, there would seem to be no reason why a portion of the subway beneath the sidewalks of a city might not be used for this purpose without any great inconvenience to the occupants of buildings, and at a considerably less cost than that necessitated by independent conduits.

Any system of underground conductors is necessarily much more costly than an aerial one, and much less flexible to meet the changing needs of an efficient electric service. It would, therefore, be desirable to retain the overhead wires in many cases, and if they can be made comparatively inoffensive, as they readily can be, there is no sufficient reason for making war upon them. As ordinarily arranged, the cross section of a group of 120 wires is about 6x12 feet. These can all be gathered into a cable of less than an inch and a quarter in diameter, and a number of these strung on light iron poles would be neither unsightly nor a cause of danger. The telephone companies are now very generally adopting the cable system, and it is equally applicable to the telegraph lines of every variety. Its complete adoption would sweep away the cobweb of lines which now disfigure the streets, and render unnecessary the hampering of the service by the construction of costly subways. In a recent consideration of the subject in the *Popular Science Monthly*, Dr. Jacques, the electrician of the Bell Telephone Company, points out that for the present telephone service the cost of underground conductors would be prohibitory of the use of the telephone. The wires leave the exchange together, but they immediately begin to diverge to the offices of individual subscribers, so that to follow out these branching lines of wire underground would manifestly be impracticable. He therefore advocates the running of cables to points of consumption, from which subscribers can be reached by short wires over or through adjacent buildings.

Magnetized Watches.

At the Physical Society, London, on February 23, Professor George Forbes read a paper on the behavior of a chronometer watch, which he had accidentally magnetized by taking it near magnets. He found that the losing rate was several minutes a day; but that it varied with the position or azimuth of the watch. This fact suggested to him the feasibility of constructing an integrating chronometer which would give the mean course of a ship during her voyage. Examination of the works showed that the watch was magnetized in the bar of the balance, and in some screws. He attributed the change of rate in the magnetized watch to these causes, and also perhaps to magnetization of the hairspring, and the Arago induction effect of the moving bar on the metal case. The watch has been refitted by Messrs. Dent & Co. with a gold spring and platinum-silver balance; but while free from magnetization, the least shock is apt to distort the balance, and Professor Forbes is now having it fitted with a platinum-iridium balance. The watch is so non-magnetizable in its renovated condition that Professor Forbes has placed it with impunity on the pole of a dynamo. We may add that soft iron cases were sold at the Vienna Electrical Exhibition as magnetic shields for watches, and are said to have answered the purpose; but some definite and reliable tests are wanted to assure people as to their value. Undoubtedly many watches have been ruined by the introduction of electric lighting; and it would be well if some effective protection for existing watches were obtainable.—*Engineering* (*London*).

Book Notice.

"The Military Telegraph during the Civil War in the United States," by William R. Plum, LL. B., of the Chicago Bar. Two volumes, handsomely bound in cloth. Portraits and illustrations. Delivered free on receipt of price, $5 Delano & Company, publishers, 23 Park Row, New York.

The object of this work is to show the valuable services rendered by the Military Telegraph in the late Civil War In order to illustrate the importance of the telegraph, and give it due setting, it was necessary to give a running account of the struggle itself. In this the author has been greatly aided by important telegrams and other papers, official and otherwise, which have never been published, and by many officers and operators, North and South, who have furnished interesting and important facts from their point of view.

The first chapter gives much curious and valuable information regarding systems and devices for speedy communication in wars from the earliest periods to the introduction of the electric telegraph. The second chapter, entitled "War Cryptographs," reveals many interesting and important facts concerning cipher systems used in war and explains fully all those employed by the Federal and Confederate authorities during the Rebellion; it also shows how the C. S. mail and telegraph cipher keys became known to the Unionists, and the important consequences thereof.

The third, and nearly all of the remaining chapters, are devoted to a running account of the war, with the services of the Telegraph Corps so closely interwoven that their surprising importance to the Federal cause is quite manifest. The history of the war is here revealed from a novel and interesting standpoint, which the opinions of the press, will quite fully and less partially indicate.

The Palmer Wire Company have sold nearly 4,000 miles of iron and steel wire to telephone companies alone since January 15th, 1884.

The Italian Government has determined to offer, on the occasion of opening the Turin Exhibition, a prize of 10,000 francs for the most practical process for the transmission of electricity.

A new style of telephone has been invented by a Burlington man. It is said that its peculiarity consists in the fact that you can talk through it. This, however, is doubted.—*Carbon Wadsworth.*

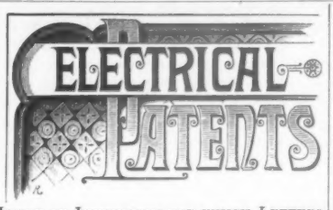
A CORRECT DEFINITION.—"Papa, what is meant by an anomaly?" "An anomaly, my son," replied the father, "is a man who pays his gas bill without referring to the company as a thief."—*F. B. K. Old Guard.*

Mr. J. Chester Wilson has secured the Philadelphia agency for the electric gas lighter, manufactured by the Domestic Electrical Company, of Boston, of which too much cannot be said of its utility as a household convenience. Mr. Wilson, like many who are in the electrical fields to-day, is a young and enterprising man. His establishment on Chestnut Street is conveniently located, and the display of all kinds of electrical apparatus for telegraphic ordinary service and convenience, is excellent.

The largest manufacturer of insulated wire in Philadelphia is Mr. Alfred F. Moore, whose works are located at 200, 202 and 204 North 3rd Street. This establishment is one of the oldest in the country, and was established in 1820. The goods manufactured consist of all kinds of covered and insulated wire that is now used in electrical industries. Modern covering machinery is used, most of which was made by the New England Butt Company of Providence, and a superior quality of work is thereby secured. The catalogue and price list issued by Mr. Moore contains just such information as managers and superintendents should have at hand for easy reference.

In a new electric lamp, invented by Frederick H. Varley, England, the ordinary solid carbon pencils are replaced by carbon wicks, or flexible carbon fibers, which, burning slowly in the air, are fed out by a peculiar mechanism. The arc between the points is claimed to be composed of a dense atmosphere of glowing carbon molecules, which produce a soft but powerful light. The carbon wicks, it is said, do not become pointed, but consume evenly over their entire surfaces, so that the regulation of the feed is much easier than with the ordinary arc lights. The carbon wicks are formed of hempen ropes, which, being coated with paraffin or crude "Ozokerite," are carbonized by exposure for ten or twelve hours to the heat of a sealed smelting furnace.

President Norvin Green submitted to the Executive Committee of the Western Union Telegraph Company a financial statement (estimated) for the quarter ending March 31, 1884. According to this statement there was a surplus on the 1st of last January of $3,970,931.78. The net revenues of the quarter ending March 31, based upon nearly completed returns for January, partial returns for February, and estimating the business for March, will, it is stated, be about $1,650,000, which, added to the surplus on hand Jan. 1, makes $5,620,931.78. Out of this amount must come $126,420.90, being interest on the bonded debt and sinking funds. For a dividend of 1¼ per cent. on the capital stock, $1,390,800 will be required after the payment of which, according to the figures given, a surplus of $4,094,710 88 will remain. The Executive Committee ordered that a quarterly dividend of 1¾ per cent. be declared, payable April 15, to stockholders of record. The transfer books will close March 20.



INDEX OF INVENTIONS FOR WHICH LETTERS PATENT OF THE UNITED STATES WERE GRANTED IN THE WEEK ENDING MARCH 11, 1884.

294,842 Electric door-pull; Charles Beile, Brooklyn, assignor to Beile & Sulzer, New York. N. Y.

294,851 Tip for electric conductors; William A. Childs, Englewood, N. J., and Frank Shaw, New York, N. Y.

294,892 Dynamo-electric machine; Chas. M. Lungren, New York, N. Y.

294,906 Underground electric conductor system; Thomas J. Perrin, New York, N. Y., assignor to Charles P. Huntingdon, same place.

294,913 Dynamo-electric machine; Charles Richter, Camden, N. J.

294,928 Electric wire connector; Thomas D. Stevenson, St. Louis, Mo.

295,058 Electric-light regulator and cut-out; Robt. J. Sheehy, New York, N. Y.

295,059 Electric gas-lighter; Edwin L. Shute, Ansonia, assignor to John E. Earle, New Haven, Conn.

295,073 Telegraph wire supporter; Ross C. Stone, New York, N. Y.

295,074 Telegraphic transmitter; Ross C. Stone, New York, N. Y.

295,075 Telegraphic transmitter; Ross C. Stone, New York, N. Y.

295,086 Compound electric cable; Richard S. Waring, Pittsburgh, Pa.

295,087 Holder for the carbons of incandescing electric lamps; Alexander Welch, St. Denis, Md., assignor to the Viaduct Manufacturing Company, Baltimore, Md.

295,088 Electric lamp; Alexander Welch, St. Denis, Md., assignor to the Viaduct Manufacturing Company, Baltimore, Md.

295,094 System of electrical haulage; William E. Ayrton and John Perry, London, England.

RE-ISSUES.

10,458 Uniting electric cables; Richard S. Waring, Pittsburgh, Pa.

10,459 Branching electric cables; Richard S. Waring, Pittsburgh, Pa.

A printed copy of the specification and drawing of any patent to the annexed list, also of any patent issued since 1865, will be furnished by any of the patent solicitors whose advertisements appear in this journal. In ordering please state the number and date of the patent desired.

Synchronous Multiplex Telegraphy.

The next meeting of the Society of Arts in Boston will be of unusual interest, as Mr. Delany, inventor of the synchronous multiplex system of telegraphy, will then describe that system, and give a practical demonstration of its working. Mr. Delany has of late attracted a great deal of attention in scientific circles, and as one of the latest and most wonderful developments in electrical science, his invention is of special interest to all who are concerned with electricity. It admits of a large number of separate messages being sent simultaneously in either or both directions over the same wire, and may be used either with the Morse or the printing system, or both. It will soon be put into practical operation on a line now being constructed from New York to Boston. Mr. Delany will show it in operation. Mr. Delany has arranged 12 stations on opposite sides of the hall, in two sets, of six each, connected by a single wire; and between any or all of these, messages may be sent simultaneously, and he will fully explain the principles involved in the invention. The exhibition of the practical working of the system to-morrow evening, will be the first ever given before any scientific society. The system has been described before the Franklin Institute of Philadelphia, and elsewhere, but never before shown in operation as it will be on this occasion.

The new office of the Palmer Wire Company at 15 Courtlandt Street, has already become quite a *rendezvous* for telephone men, no less than eleven from out of town having called there one day last week. So much for the popular general agent.

BUSINESS NOTICES.

A. C. NORTHROP, Waterbury, Conn. Iron and Brass Machine Screws, Zinc in Sheets and Plate for Electrical Purposes, Parts for Telephone and Telegraph Instruments, Manufactured from Iron, Brass, Steel or Zinc.

A. G. DAY, Kerite Insulated Telegraph and Telephone Wire and Cables, Anti-induction Kerite Telephone Cables, CLARKE B. HOTCHKISS, New York. Send for circular and prices.

ALFRED F. MOORE, Philadelphia, Pa. Telegraph, Telephone, Electric Light, Office, Line and Annunciator Wire.

AMERICAN BELL TELEPHONE Co., Boston, Mass. Electric Speaking Telephones for Exchange Systems, Private Lines, and Speaking-tube Lines.

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AUSTIN GALLAGHER, New York. Keith Electric Light System complete for Arc Lighting. Stock for sale.

BAXTER ELECTRIC LIGHT COMPANY, New York. The Baxter Lamp.

B. W. PAYNE & SONS, Corning, N. Y. The Payne Single and Double Valve Automatic Engine. Send for catalogue.

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CHARLES WILLIAMS, JR., Boston, Mass. Call Bells, Electric Bells, District Bells, Switch Boards, Annunciators, &c., &c. Write for quotations.

CHICAGO INSULATING Co., Chicago, Ill. The Fiske-Mott High-resistance Insulator. Send for circular.

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Leclanche Disque Cell, complete	$1.25
" Prism " "	$1.67
" Prisms, per pair	$1.00
" Carbon Mounted	30c.
" Jar Cover	12c.
" Sal Ammoniac, in bag	8c.
" Porous Cell	$1.10
" Glass Jar	18c.
" Amalgamated Zinc	10c.
" Rubber Bands, per pair	6c.
Chlorine Battery, per cell	$1.25
Law Battery, per cell	$1.25
" Jar and its Rubber Ring	25c.
" Cover, with small Carbon sealed in	35c.
" Large Carbons, each	20c.
" Carbon Connector	12c.
" Zinc Connector	8c.
" Rubber Bolt	12c.
" Zinc and its Rubber Ring	12c.
Bergman & Haid, per cell	$1.20
Crow foot, 6x8, per cell	75c.
Callaud Zincs	30c.
" Coppers	15c.
" Jars	25c.
Sal Ammoniac, per lb	15c.
Blue vitriol, per lb	10c.
" " bbl., lots, per lb	5½c
Sulphate of zinc	10c.
Battery syringe	$1.90c.
Battery brush	20c.
Hydrometer	50c.

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Average Telephone Stock Quotations, for week ending March 20th, 1884.

	Highest.	Lowest.
American Bell Telephone Co.	179	164
Central New York Telephone and Telegraph Company	164	160
Empire State Telephone and Telegraph Company	195	187
Hudson River Telephone and Telegraph Company	100	92
New York and New Jersey Telephone Company	86	74
Mexican Telephone Company	2½	2½
New York and Pennsylvania Telephone Company	76	67
Southern Bell Telephone and Telegraph Company	125	120
Tropical Telephone Company	2	2½
Central Union Telephone Co.	100	90
Iowa Union " "	100	90
Missouri and Kansas Telephone Co.	98	80
United Telephone Co. (Kansas and Missouri)	99	80
Bell Telephone Company, of Missouri	160	150
Wisconsin Telephone Company	120	115
Cumberland Telephone Co	100	95
Great Southern Telephone Co.	100	92
Michigan Telephone Company	100	97
Chicago Telephone Company	290	280
Erie Telephone Company	41	36
Union Telephone Company	100	95
Southern New England Telephone Company	165	160
New England Telephone Co.	53	46
Chesapeake & Potomac Tel. Co.	100	95

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The Ansonia Brass & Copper Company of New York, is now manufacturing what it calls "acme bronze" wire, especially for telegraph and telephone purposes, which is highly spoken of. Lake Superior copper is used in its construction.

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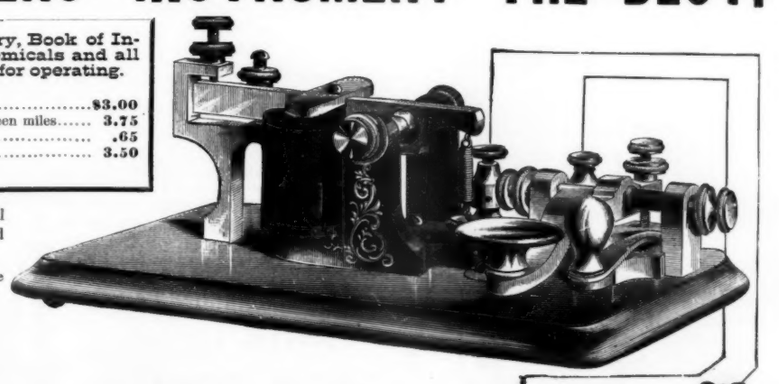

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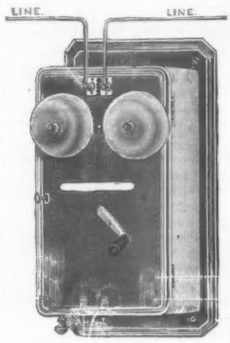

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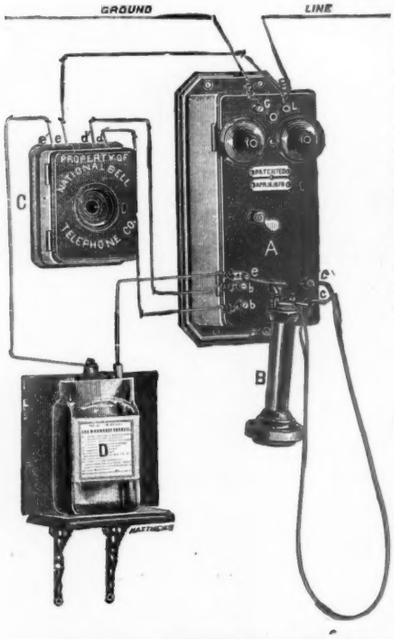

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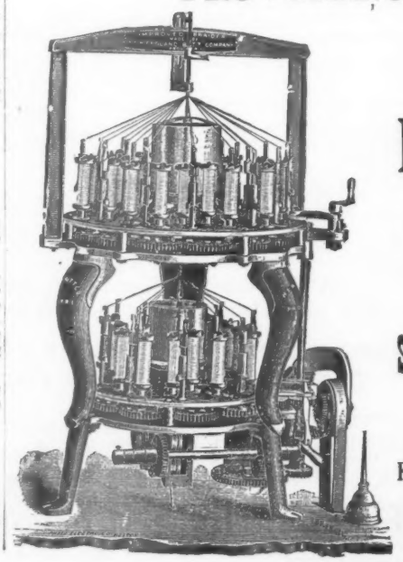

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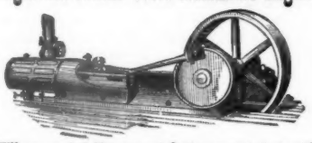

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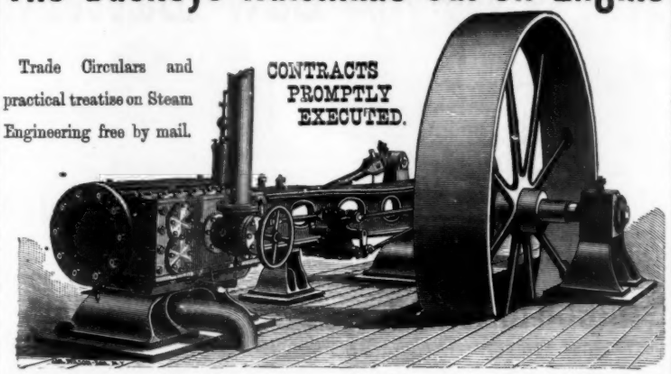

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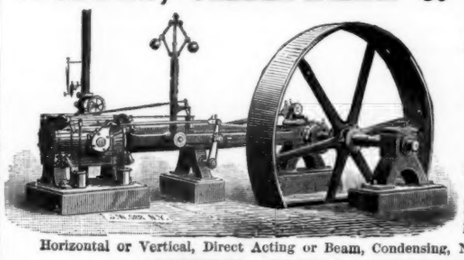

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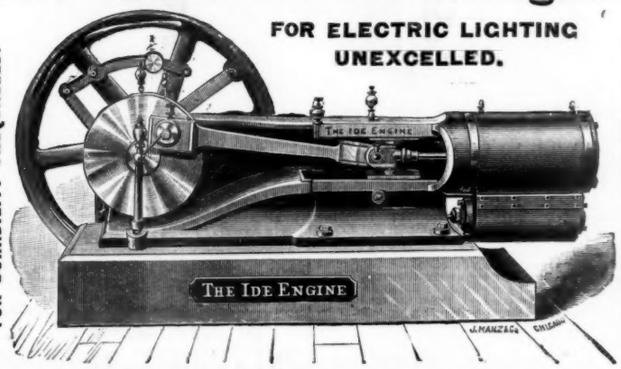

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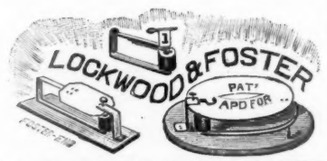

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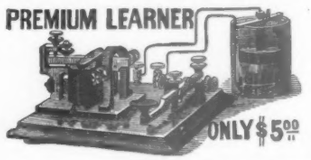

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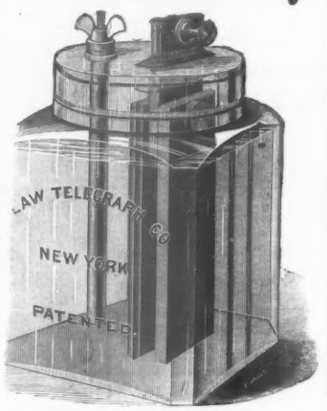

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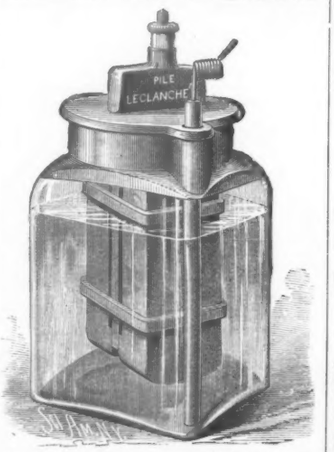

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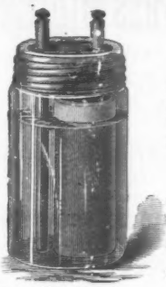

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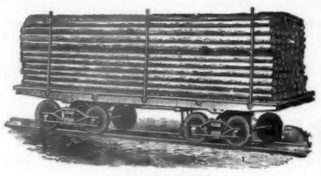

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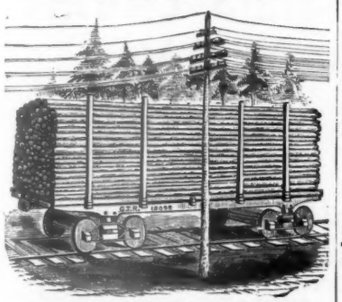

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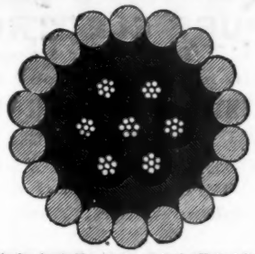

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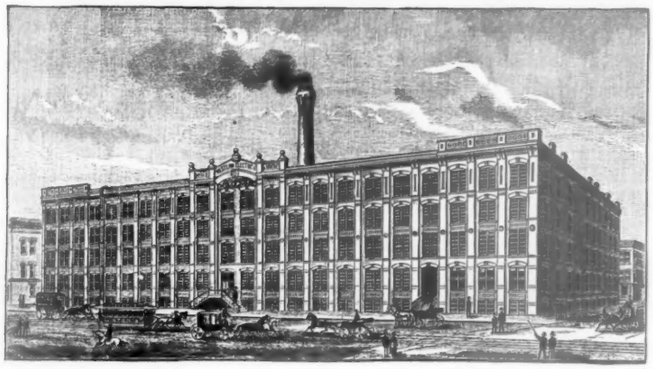

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